NIE
NATIONAL INSTITUTE OF EDUCATION
SINGAPORE

An Institute of

NANYANG TECHNOLOGICAL UNIVERSITY
SINGAPORE

# PROFESSIONAL LEARNING CATALOGUE

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# PROFESSIONAL LEARNING AT NIE

**The National Institute of Education, Nanyang Technological University, Singapore** believes in lifelong learning. In alignment with NIE's mission to excel in Teacher Education, the range of professional development programmes and courses offered by NIE to meet the needs of our various stakeholders is instrumental in enabling the fulfilment of this mission. In addition, one main feature of NIE's Teacher Education Model of the 21st Century is the consi deration of teachers' needs on an enhanced pathway of professional learning (PL). We believe our professional learning programmes for teachers are instrumental in meeting teachers' aspirations.

Our programmes are tailored to the learning needs of school teachers as well as educators and professionals working in various educational settings. In particular, we have six focus areas in our programmes and courses to:

1

**UPGRADE**
content knowledge of teachers;

2

**UPDATE**
teachers with pedagogical innovation in subject teaching;

3

**EQUIP**
teachers with new competencies in response to societal needs and demands;

4

**KEEP**
teachers abreast of new developements and initiatives in education;

5

**EDUCATE**
teachers with research and management skills;

6

**ENHANCE**
their teaching effectiveness through life-long learning.

These areas of focus will enable our teachers to advance and master the set of Teacher Competencies they have attained since their graduation from their initial teacher preparation programmes. In addition, these programmes are also designed with the MOE Teacher Growth Model (TGM) in mind, providing learning opportunities for the ethical educator, the competent professional, the collaborative learner, the transformational leader and the community builder. We continue to provide quality teaching and learning to enable our teachers in their learning journeys through three key modes of PL.

## CERTIFICATION PROGRAMMES

NIE offers a suite of Certificates, Diplomas, and Advanced Diplomas that cater to the range of professional needs of Singapore educators. These structured programmes are grounded in continuing life-long learning principles to meet the career needs of practising teachers and educational professionals in a changing education sector.

## STAND-ALONE PROFESSIONAL LEARNING COURSES

Apart from Certification programmes, NIE offers two categories of stand-alone PL courses. These can be generic in-service courses designed in response to contemporary policy, curriculum and pedagogy that are relevant to teachers' aspirations and the mission of MOE. Another type of stand-alone course is the in-service course taught at a graduate level that provides learning experiences to teachers. This is done on a 'modular' basis to enable them to learn at their own pace, without first having to register for a master's programme. This enables teachers to accumulate academic credits for consideration of admission to higher certification programmes.

## CUSTOMISED WORKSHOPS

In addressing the needs of our stakeholders, NIE often responds to requests from educators to run customised workshops. In order to provide to prospective educators who require customised training,p we have included a section on the areas of learning for customised school-based workshop in this catalogue.

In short, NIE is committed to providing relevant, responsive, rigour-tested, practice-proven, evidence-informed and technology-mediated knowledge solutions and innovations in educational policy, process and practice to meet organisations' and individuals' professional needs.

# CERTIFICATES & DIPLOMAS

### Certificate in Differentiating Curriculum and Instruction for High Ability Learners

This certificate programme seeks to provide teachers from independent schools as well as those working in various educational settings with further professional development opportunities to enhance their knowledge and skills in meeting the needs of learners who have been identified as high ability learners (HAL). This programme is targeted at a wide range of educators, from those working in the early childhood sector to those in institutions of higher learning to facilitate and develop a continuum of educational support for HALs.

### Certificate in Foundational English Language Subject Content Knowledge for Teachers

This certificate programme seeks to provide participants with an understanding of key concepts and theories within the fields of English Language Studies and English Language Teaching that will equip them to implement the MOE English Language syllabus more effectively.

### Certificate in Primary Mathematics Education

This programme aims to prepare the teachers for specializing in primary mathematics teaching at the upper primary level, with emphasis on the topics that are taught in the primary mathematics curriculum. Each course will also examine the related assessment practices based on the subject matter knowledge of the topic.

### Certificate in Teaching Students with Autism in Special Education School

This certificate programme will focus on enhancing the capacities, skills and practices of the teachers teaching students with autism. It aims to provide knowledge of autism and developmental trajectory of individuals with autism through their lifespan, to equip the teachers in the SPED schools with the pedagogical knowledge and skills in teaching students with autism and to apply new knowledge of evidence-based practices through their implementation and evaluation to identified learning and behavioural concerns.

### Diploma in Physical Education (In-service)

This programme seeks to develop professional competence and expertise in teaching Physical Education as a major subject. It seeks to enable teachers to follow an academic and knowledge-based approach to the subject area of Physical Education. The programme aims to give teachers a grasp of the physical, psychological, sociological and philosophical principles essential to an understanding of the physical education teaching process.

### Certificate in Educational Assessment

This certificate programme seeks to provide participants with a strong grounding in both the theories and methods of assessment in order that they can conceptualise and review assessment practices.

### Certificate in Educational Support

This programme aims to deepen the professional knowledge and skills of participants in relation to (a) supporting the specific socio-emotional needs of the low progress learners, and (b) supporting the specific learning needs of the low progress learners. It is designed to meet the key learning areas in the Professional Development Roadmap for Secondary School Teachers - Teaching Low Progress Learners, namely: “characteristics of low progress learners and social-emotional learning/TSR strategies”, “motivation and education and career guidance” and “pedagogical practices”.

### Certificate in Primary Science Education

This programme aims to equip teachers with knowledge and understanding of biological and physical science topics, and how the topics are connected to each other. In addition, the courses will equip teachers with the knowledge and skills in planning and implementing holistic assessment in primary science.

### Certificate in Special Needs Support

This programme serves to provide mainstream teachers in the primary and secondary schools with more in-depth knowledge, skills and understanding of the special needs of diverse learners and foster the development of teachers’ education.

### Certificate in Teaching Students with Hearing Loss

The certificate programme will allow teachers to have greater knowledge of the impact of hearing loss on learning and the approaches in supporting these students in the classroom. The landscape in the education for students with hearing loss has changed with a new initiative of including students who use sign language in the mainstream schools. The programme recognises the need to provide opportunities for teachers to deepen their knowledge and teaching pedagogy so as to level up the skills and knowledge

# ADVANCED DIPLOMAS

## Advanced Diploma in Primary Art Education

This programme provides teachers with a framework of knowledge and skills in art. It also provides perspectives on the change and development of theories and trends in art and art education for teachers to reflect, re-examine and to draw inferences about their classroom practices. Lastly, it enables tseachers to develop competencies in the evaluation and planning of effective art curriculum and programme in their schools.

## Advanced Diploma in Primary Mathematics Education

This programme provides teachers with a framework of knowledge and skills in the teaching of primary mathematics. It also provides perspectives on the change and development in primary mathematics curriculum for teachers to reflect re-examine and refine their classroom practices. Lastly, it enables teachers to develop competencies in the design and practice of assessment and evaluation.

## Advanced Diploma in Primary Science Education

This programme provides teachers with a framework of knowledge and skills in the teaching of primary science. It also provides perspectives on the changes and developments in the primary science curriculum for teachers to reflect, re-examine and refine their classroom practices. Lastly, it enables teachers to develop competencies in the design and practice of assessment and evaluation.

## Advanced Diploma in Teaching Early Primary School Years

Closely coordinated with various MOE initiatives, this programme seeks to develop professional competence and expertise in teaching lower primary children. It will help teachers understand how children learn and develop; and thus create a learning environment that keeps children safe as well as support engaging activities that promote quality learning. Teachers will develop effective and age-appropriate strategies to promote children's learning; understand goals, benefits and uses of systematic observations and varied forms of assessment to impact the development of children. They will learn to understand strategies of family and community engagement to promote positive learning outcomes for children, deepen their understanding of how children's language skills and numeracy develop in the lower primary and develop engaging teaching and learning activities to foster these skills. Lastly, they will broaden their leadership potential and expand their professional confidence and impact as teacher leaders.

## Advanced Diploma in Primary English Language Education

This programme provides teachers with a framework of knowledge and skills in teaching primary English language. It also provides perspectives on the change and development in the primary English language curriculum for teachers to reflect, re-examine, and refine their classroom practices. Lastly, it enables teachers to develop competencies in the design and practice of assessment and evaluation.

## Advanced Diploma in Primary Music Education

This programme provides teachers with a framework of knowledge and skills in music. It apprises music teachers of the current thinking and practice in Music and Music Education and provides opportunities for teachers to reflect on and re-examine their classroom practices. Lastly, it enables teachers to develop competencies in the evaluation and planning of effective music curricula and programmes in their own schools.

## Advanced Diploma in Special Learning and Behavioural Needs

This programme provides a framework of knowledge and skills and inculcates attitudes which are important to the education of students with special needs. It also examines the range of factors that facilitates or hinders the learning of a student with special needs in mainstream schools; thus enabling teachers to develop competencies in assessing, planning, implementing, and evaluating programmes for students with special needs. Lastly, the programme provides teachers with the basic knowledge and skills for supporting students with various types of disabilities.

## Advanced Diploma in Special Education

This programme focuses on enhancing the capacities, skills and practices of the Allied Educators (Learning and Behavioural Support) and Special School Teachers using a "reflective-practitioner" and "learning-based" approach to develop appropriate classroom-based and school-level supports for pupils with special needs in mainstream or special schools.

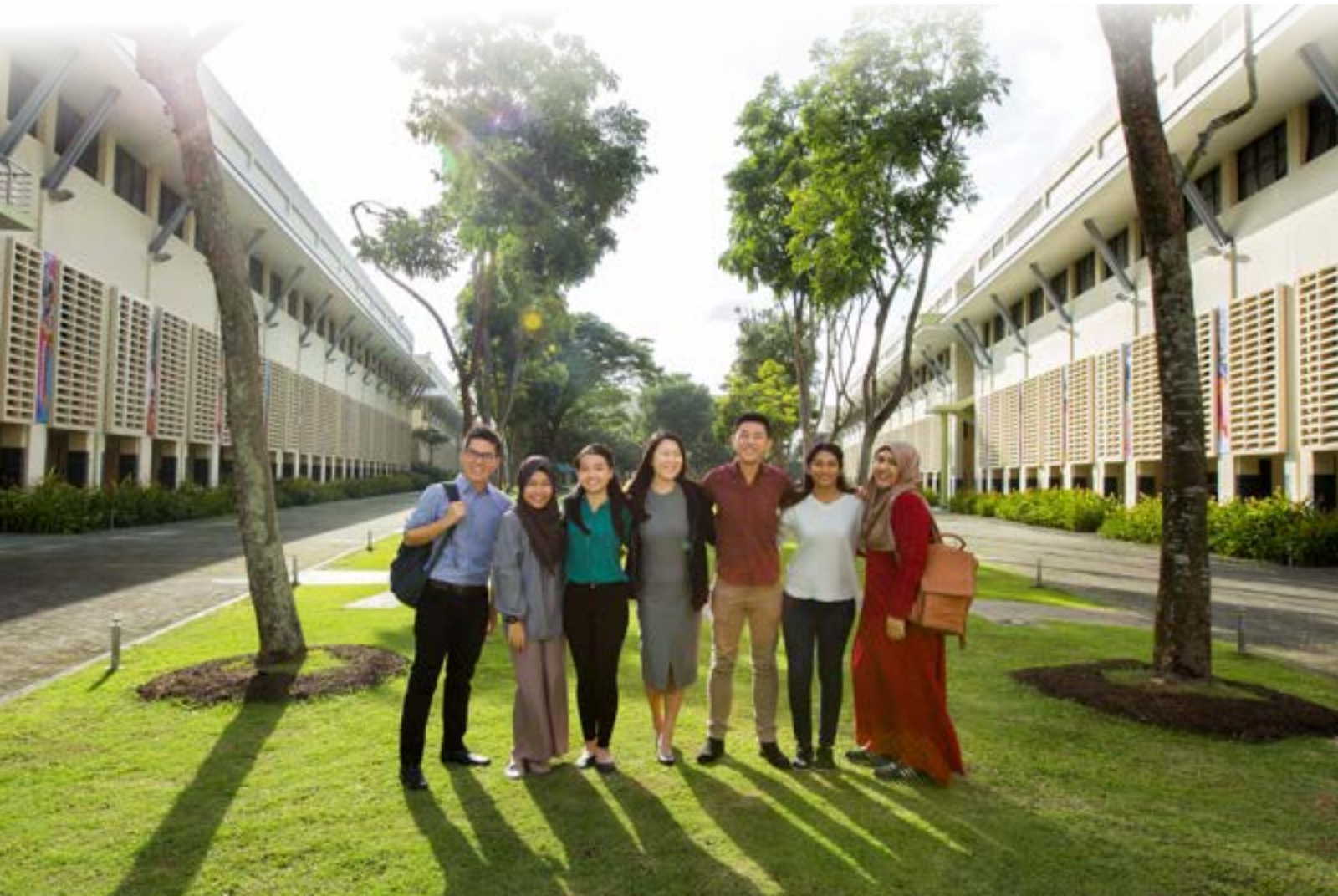
## Advanced Diploma in Teaching

The purpose of this Advanced Diploma in Teaching is to offer the opportunity to customize your own learning, based on your instructional needs and interests in different schools; and across at least two subject areas within the primary school curriculum. It also offers a greater scope of elective courses otherwise unavailable within disciplinary Advanced Diplomas.

# FLEXIMASTERS

The Modular Graduate Courses (MGCs) offered by NIE are intended to be less research-focused and encompass academic as well as skills-based courses, offered at a Master's level. These courses allow further enhancement or specialisation of knowledge beyond a basic degree, and provides opportunities for individuals seeking career advancement, career change, professional development or simply the pursuit of life-long learning.

Learners may therefore take courses for personal or professional development, or to enhance their academic qualifications. They will be awarded a Statement of Accomplishment at the completion of each course. These courses may be stacked to qualify for a Graduate Certificate, an NTU FlexiMasters Certificate and, where appropriate, even an NTU Master's degree.



# ADVANCED PEDAGOGICAL PRACTICES

## MTC901 Nurturing Learners and Learning

*https://www.ntu.edu.sg/pace/programmes/detail/mtc901-nurturing-learners-and-learning*

In this course, participants will be introduced to:

1) The art and science of positive education to encourage and support students thriving and flourishing. Participants will be introduced to the concepts of flourishing and well-being and gain an overview of the principles of Positive Education and how it can help school communities to flourish. This course explores the benefits of Positive Education, the underlying research that guides teaching practice and interventions drawn from successful frameworks of social-emotional learning, mental health and positive psychology. Participants will have the opportunity to reflect on how the concepts in the domain areas of positivity, positive relationships, positive engagement and positive accomplishment can be nurtured and embedded in classroom and school contexts.

2) The science of positive psychology to encourage and support schools and individuals to flourish. Participants will be introduced to the concept of wellbeing and its constituent components, with specific focus on Character Strengths and Mindfulness. Hence, participants will have the opportunity to develop and practice the skills, knowledge and strategies needed to enhance their students, childrens or employees well-being, while developing their character strengths and mindfulness.

3) The concept of motivation and the various approaches to motivational studies, namely the behaviourist, humanistic, cognitivist and socio-cultural perspectives. They will explore the factors influencing learner motivation, and the reasons why some learners are more motivated than others. Finally, they will have the opportunity to develop and apply the skills, knowledge and strategies needed to enhance their students, children's or employees motivation to learn.

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## MTC902 Designing Curriculum: Theory and Practice

*https://www.ntu.edu.sg/pace/programmes/detail/mtc902-designing-curriculum-theory-and-practice*

This course expands participants understanding of curriculum beyond the narrow conception of curriculum as a plan that teachers simply deliver and invites them to use different conceptual tools and perspectives to examine their personal experiences with curriculum. In this way, the course helps participants to reconsider teachers agency and responsibilities in curriculum designing and enactment and bring about improvements in curriculum practice.

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## MTC903 Assessment for Learning: Theory and Practice

*https://www.ntu.edu.sg/pace/programmes/detail/mtc903-assessment-for-learning-theory-and-practice*

Assessment for Learning (AfL) is referred to ubiquitously in Singaporean classrooms, but its meanings, implications and applications in schools and wider workplace learning contexts are less clear. This course first examines the discourse of AfL and formative assessment, against its varied and different theoretical constructions from Anglophone countries (e.g. USA and UK), before examining regional case studies from more recent times.

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## MTC904 Facilitating Learning in the Digital Age

*https://www.ntu.edu.sg/pace/programmes/detail/mtc904-facilitating-learning-in-the-digital-age*

With the advent of the digital age, the profile of the learners in the education system has changed dramatically. It is, therefore, imperative that educators evaluate their instructional strategies for designing learning and adapt existing practices to better meet the learning needs and preferences of the digital generation. This is to empower them to handle the complex challenges of a highly globalised and digitised world. Rethinking pedagogy for the 21st century is as crucial as identifying the new competencies that todays learners need to develop in this digital age. This course explores the pedagogies, learning environments, theories, perspectives and considerations on the use of various digital media technologies to develop 21st century competencies and skills in the learners.

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# BITE-SIZED COURSES

## MTC901A Enhancing Learner Wellbeing, Positive Education Purpose and Practice

*https://www.ntu.edu.sg/pace/programmes/detail/mtc901a-enhancing-learner-wellbeing-positive-education-purpose-and-practice*

This course seeks to introduce learners to the art and science of positive education to encourage and support students thriving and flourishing. Learners will be introduced to the concepts of flourishing and well-being and gain an overview of the principles of Positive Education and how it can help school communities to flourish. This course explores the benefits of Positive Education, the underlying research that guides teaching practice and interventions drawn from successful frameworks of social-emotional learning, mental health and positive psychology. Learners will have the opportunity to reflect on how the concepts in the domain areas of positivity, positive relationships, positive engagement and positive accomplishment can be nurtured and embedded in classroom and school contexts

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## MTC901B Enhancing Learner Wellbeing, Character Strengths and Mindfulness

*https://www.ntu.edu.sg/pace/programmes/detail/mtc901b-enhancing-learner-wellbeing-character-strengths-and-mindfulness*

Positive education is a paradigm that combines traditional education focused on academic skill development with approaches that nurture wellbeing and promote good mental health (Seligman, 2011). In the process, students' social, emotional, moral and intellectual facets are developed (Waters, 2011). Significant to this perspective is the scientific inquiry into factors and strategies that promote wellbeing from a preventive and proactive rather than deficit model (Ahern, 2017). In view of this inherently worthy goal, this course seeks to introduce learners to the science of positive psychology to encourage and support schools and individuals to flourish. Learners will be introduced to the concept of wellbeing and its constituent components, with specific focus on Character Strengths and Mindfulness. Hence, participants will have the opportunity to develop and practice the skills, knowledge and strategies needed to enhance their students', children's or employee's well-being, while developing their character strengths and mindfulness.

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## BITE-SIZED COURSES

### MTC901C Enhancing Learner Motivation

*https://www.ntu.edu.sg/pace/programmes/detail/mtc901c-enhancing-learner-motivation*

In addition to good teaching, what makes an effective teacher is the possession of an inherent ability to understand what motivates students to learn and why. This course introduces participants to the latest theories, research and applications of motivation and engagement in learning and teaching. Participants will first be introduced to the concept of motivation and the various approaches to motivational studies, namely the behaviourist, humanistic, cognitivist and socio-cultural perspectives. They will explore the factors influencing learner motivation, and the reasons why some learners are more motivated than others. Finally, they will have the opportunity to develop and apply the skills, knowledge and strategies needed to enhance their students', children's or employees' motivation to learn.

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### MTC902A The Teacher and the Curriculum

*https://www.ntu.edu.sg/pace/programmes/detail/mtc902a-the-teacher-and-the-curriculum*

This course invites participants to critically examine their lived experiences and views about curriculum, curriculum designing, and curriculum practice through different perspectives—philosophical, historical, socio-political, psychological, and pragmatic. Participants will encounter key concepts and theories in curriculum studies as well as philosophical, sociopolitical, and practical considerations that have a bearing on the design and enactment of a curriculum. Throughout the course, participants will have several opportunities to examine their views about curriculum and reconsider their personal purpose and role(s) in curriculum design and enactment. In addition, they will also explore various curriculum practices, such as the use of formative assessments, inquiry-based learning, project-based learning, differentiated instruction, epedagogies, etc., in relation to educational philosophy, history, sociology, psychology and their personal educational beliefs and values.

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### MTC902B The Elements of Curriculum and Curriculum Designing

*https://www.ntu.edu.sg/pace/programmes/detail/mtc902b-the-elements-of-curriculum-and-curriculum-designing*

This course guides participants in the analysis and evaluation of existing curricula and curriculum practices. This includes critical discussions of how educational objectives, subjects, programmes, and teaching approaches (e.g., differentiated instruction, formative assessment, inquiry-based learning, project-based learning, e-padagogy, etc.) are typically understood, selected, designed, and applied. Participants will explore the various factors and considerations that influence curriculum decisions and examine curricular consequences beyond those immediately related to explicitly stated educational objectives, such as the inevitable and often inadvertent shaping of teachers' and students' beliefs and attitudes about education and learning. They will come to appreciate curriculum designing as fundamentally a situated cognitive activity.

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## BITE-SIZED COURSES

### MTC902C Teachers as Curriculum Designers

*https://www.ntu.edu.sg/pace/programmes/detail/mtc902c-teachers-as-curriculum-designers*

The centrepiece of this course is a curriculum design project. Through this project, participants will develop deeper conceptual understandings of the interrelationships among the various elements of curriculum and the many factors and considerations that influence the design and enactment of a curriculum, as well as appreciate the larger ethical and practical implications of teacher interpretation and agency in classroom curriculum designing. The course culminates in an invitation to participants to synthesise and consolidate what they have learned in The Teacher and the Curriculum course and The Elements of Curriculum and Curriculum Designing course and critically review their beliefs about curriculum and curriculum designing.

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### MTC903A Assessment for Learning: An overview of theory and practice

*https://www.ntu.edu.sg/pace/programmes/detail/mtc903a-assessment-for-learning-an-overview-of-theory-and-practice*

Assessment for Learning (AfL) is referred to ubiquitously in Singaporean classrooms, but its meanings, implications and applications in schools and wider workplace learning contexts are less clear. This course gives an overview of the discourse of AfL and formative assessment, against its varied and different theoretical constructions from Anglophone countries (e.g. USA and UK), before examining regional case studies from more recent times. Through group discussions and examples of current practices, participants are guided to critically examine and interact with their perceptions and practices of AfL, permeating day-to-day classroom work.

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### MTC903B Assessment for Learning: Deep dive into issues and possibilities

*https://www.ntu.edu.sg/pace/programmes/detail/mtc903b-assessment-for-learning-deep-dive-into-issues-and-possibilities*

The course aims to problematize AfL using social-cultural lens, while also situating it within subject specific (or work/industry) issues, school policy and wider societal realities in Singapore. The construction and/or revision of formative assessment rubrics is used as a launch pad to discuss optimal changes in classrooms or workplace to enhance learning.

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### MTC903C Assessment for Learning: Putting it together

*https://www.ntu.edu.sg/pace/programmes/detail/mtc903c-assessment-for-learning-putting-it-together*

The course begins by revisiting the tensions between different AfL agendas particularly from social-cultural perspective before examining the society/school-wide, teachers and students' teaching/learning conditions, processes, functions and outcomes of efficacious practices of AfL.

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## BITE-SIZED COURSES

### MTC904A Facilitating Learning in the Digital Age: Part 1 Digital Learning – The tripartite relationship

*https://www.ntu.edu.sg/pace/programmes/detail/mtc904a-facilitating-learning-in-the-digital-age-part-1-digital-learning-the-tripartite-relationship*

Participants will be introduced to the fundamentals of facilitating learning in the digital age. They will explore the changing role of educators and learners and how to effectively facilitate learning in the digital age. They will also critically evaluate how learning through digital technologies can transcend the physical learning space and the changes that need to be adopted in pedagogy to align with that reality. Using a blended learning approach, participants will experience e-pedagogy first hand - how learning is facilitated seamlessly from one learning space to another through technology mediation.

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### MTC904B Facilitating Learning in the Digital Age: Part 2 Digital Learning – Theory-practise nexus

*https://www.ntu.edu.sg/pace/programmes/detail/mtc904b-facilitating-learning-in-the-digital-age-part-2-digital-learning-theory-practise-nexus*

Participants will explore the design considerations for learning with digital tools. They will examine the theoretical foundations that underpin learning with digital tools. They will apply these key concepts in designing meaningful learning activities and experiences for their learners. The participants will also learn how the data presented to them in terms of the student artefacts can be used to differentiate instructions using technology tools to better enhance their students' learning.

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### MTC904C Facilitating Learning in the Digital Age: Part 3 Digital Learning – Critical perspectives and deepening understanding

*https://www.ntu.edu.sg/pace/programmes/detail/mtc904c-facilitating-learning-in-the-digital-age-part-3-digital-learning-critical-perspectives-and-deepening-understanding*

Participants will recall the key concepts that determine effective learning through the use of technology tools. They will critically explore and examine the challenges and effectiveness in the various facilitation approaches to learning in the digital age. Participants will deepen their understanding of how and why learning needs to be differentiated and how this can be facilitated through technology tools. They will develop an understanding of how to utilise the visible thinking and information available through the students' artefacts via the digital platforms to enhance their lesson design for their learners. They will deepen their understanding through exploration of affordances of suitable technology tools and pedagogies.

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# CURRICULUM AND TEACHING

## MCT902 Crafting the Curriculum

*https://www.ntu.edu.sg/pace/programmes/detail/mct902-crafting-the-curriculum*

The process of analysis will reveal that curricula are by necessity always incomplete and imperfect—everything that is included (topic, activity, question, component, material, assessment, etc.) means that something else has been excluded. This being the case, students will suggest refinements to the curriculum they have analysed, based on their understanding of the needs. This course is an introduction to curriculum development. The underlying framework for the course is that curriculum building is a process that requires ongoing study and reflection about curriculum and the practice of teaching.

Central and perennial curriculum questions explored are: What knowledge is of most value and worth? How is the learner and learning viewed? What is the role of teachers in creating and enacting curriculum?

The process of analysis will reveal that curricula are by necessity always incomplete and imperfect-everything that is included (topic, activity, question, component, material, assessment, etc.) means that something else has been excluded. This being the case, students will suggest refinements to the curriculum they have analysed, based on their understanding of the needs of learners, the sociopolitical milieu, and the moral and ethical dimensions of schooling.

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## MCT912 Curriculum and Programme Evaluation

*https://www.ntu.edu.sg/pace/programmes/detail/mct912-curriculum-and-programme-evaluation*

This course offers an introduction to key considerations in interpreting and designing evaluation studies in the educational context. Through considering the purposes of evaluations and exploring the nature of major evaluation approaches, participants will develop understanding of the key aspects of designing evaluation studies. The primary assessment project for all students will be to design (but not conduct) an evaluation for a curricular programme, project or product.

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## MCT921 Theory and Practice of Authentic Assessment

*https://www.ntu.edu.sg/pace/programmes/detail/mct921-theory-and-practice-of-authentic-assessment*

This course aims to provide participants with a sound grasp of the theoretical underpinnings of authentic assessments as well as practical skills needed for designing authentic assessments. More specifically, it aims to provide participants with 1) conceptual clarity on “authenticity”; 2) principles for designing quality authentic assessments; 3) a critical perspective of the role of authentic assessment within Singapore’s educational system. The course will be conducted through discussions, group presentations, online forums, and hands-on activities. Participants are expected to critically appraise literature on authentic assessments and to develop an authentic assessment that will enhance the learning of their students.

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## MCT935 New Media and 21st Century Learning

*https://www.ntu.edu.sg/pace/programmes/detail/mct935-new-media-and-21st-century-learning*

This hands-on course aims to engage participants in examining the existing new media environment and provide an embodied new media experience for them. It addresses important, current issues in new media studies with in-depth discussion of popular perceptions/myths and implications to learning. Through the self-directed analysis of media content (critical media consumption) and production of media artefacts and participation in online communities (critical media prosumption), participants will gain a sense of new media culture and form their personal critique on the relationship between new media and 21st century learning for their refined practices.

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## MCT904 Understanding Teachers and Teaching: Theory and Practice

*https://www.ntu.edu.sg/pace/programmes/detail/mct904-understanding-teachers-and-teaching-theory-and-practice*

This course explores two intertwining themes: (1) Teacher as the curriculum maker, which explores from the interpretive perspective on how teachers acquire the knowledge, skills, and values in forming their identity in situated teaching practices and curriculum making. How do we understand the composition of teacher's knowledge, practice, and skills in making curriculum alive? What counts as teacher quality in an era of accountability? How do teachers provide and practice leadership in curriculum making? How do teachers learn at different points in the teacher's professional continuum and in different contexts? (2) Teaching as a practice, one that has been historically understood by scholars, practitioners, and policy makers from a range of theoretical perspectives. What does it mean to conceptualize teaching as a practice situated in relation to curriculum, assessment and learning? What are the many ways people have thought about teaching as a practice, and what are the consequences of those perspectives for how we understand teaching? Who can create, evaluate, and critique knowledge about teaching? The course will introduce some major frameworks that have been used to guide research, policy recommendations, and the work of teachers and teaching.

We consider the issues of teaching and teachers in an international context, drawing on research from Singapore and other countries. Some of our texts and video materials we will use will give us repeated opportunities to consider education in China, France, Japan, and the U.S. While they don't constitute a central focus of the course, they will give us some chance for shared discussion that draws on multiple and sometimes conflicting descriptions and interpretations of teaching and teacher in a particular setting. Thus, we further pursue the context-related questions when we make the familiar strange in such an international perspective: In what ways is teaching an embedded practice that is shaped by the many contexts in which it is situated? How is learning to teach a process of entering a particular culture? What does it mean to work as a teacher in response to the discourses prevalent in globalization, and the local culture of the students and the community?

As participants consider various perspectives to exploring these questions, they will be guided to reflect upon their own teaching practices and professional identity, with references to educational reforms in schools and classrooms.

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## MCT913 Differentiating Curriculum and Teaching for Diverse Learners

*https://www.ntu.edu.sg/pace/programmes/detail/mct913-differentiating-curriculum-and-teaching-for-diverse-learners*

Contemporary deliberations about the school curriculum have tended to privilege other stakeholders and marginalize students. Unless teachers are able to take seriously what students already know and believe, any innovation in curriculum or pedagogy becomes futile. All students deserve rich learning experiences. This course is designed to encourage teachers and school leaders to examine their assumptions about curriculum, teaching and learning, and to develop a critical understanding of different student learning needs in the regular classroom.

Participants will gain an understanding of the reasons and assumptions underlying differentiation. Through the readings and discussion, participants will develop an appreciation of the diverse characteristics of students who learn at different pace as well as study a variety of curriculum options such as those of content and implementation of differentiated units and lessons that optimize learning for students.

This course will examine ways that classrooms can effectively differentiate curriculum and teaching to address the complex challenges of meeting the diverse learning needs of students. These will include notions of culturally responsive pedagogy, and the use of technology. Participants will learn to use research-based tools to uncover students' experiences and challenges with the curriculum and use curriculum design models in planning appropriate and defensible differentiated curriculum units.

# EARLY CHILDHOOD EDUCATION

## MEC901 Child Development (0-8 years)

*https://www.ntu.edu.sg/pace/programmes/detail/mec901-child-development-%280-8-years%29*

The MEC901Course which is the first specialisation course in the MEd (EC) Program, provides the foundation for all the other specialisation courses. This course will help participants conceptualize childrens development across infancy, pre-school and primary school years (birth to 8 years) through the critical review of/reflection on various developmental theories, models, approaches and scholarly works.

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## MEC902 Issues and Trends in Early Childhood Education

*https://www.ntu.edu.sg/pace/programmes/detail/mec902-issues-and-trends-in-early-childhood-education*

This course aims to empower participants to explore and reflect critically on key current and historical issues and trends underpinning the developments of early childhood education (ECE), and through this, to examine and discuss how ECE in the Singapore context can benefit from developments in the wider field, and yet stay relevant to its contextual demands.

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## MEC903 Research Investigations in Early Childhood Education

*https://www.ntu.edu.sg/pace/programmes/detail/mec903-research-investigations-in-early-childhood-education*

This course introduces students to the research design process in early childhood related topics. This course is essential in preparing students for their dissertation and MMM800 (Critical Inquiry) course which would require them to conduct a small research study within a single semester. This course provides the necessary preparation by allowing students to craft a coherent research design gathering literature, sifting through theories, identifying a focused topic and honing in on the study's purpose as well as selecting the specific research methodology for their study which is centered in the early years and commonly used in early childhood education.

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## MEC906 Curriculum Design and Development in Early Childhood Education

*https://www.ntu.edu.sg/pace/programmes/detail/mec906-curriculum-design-and-development-in-early-childhood-education*

The course explores the theoretical and practical nature of various early childhood curriculum approaches across time and context. The discussion will closely examine the wide array of paradigms with the underlying conceptions about children and education in light of a range of practical implications. In order to be able to prepare to be curriculum developer, theorizer, and advocator, the course enhances participants capacity to utilize multiple critical lens to rethinking and doing of educational complexity, equity, and diversity.

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# INSTRUCTIONAL DESIGN (E-LEARNING)

## MID901 Instructional Design Models and Practices

*https://www.ntu.edu.sg/pace/programmes/detail/mid901-instructional-design-models-and-practices*

This course provides students with the understanding of the major instructional design models useful in school and training contexts. Major topics covered include the analysis of performance and instructional problems, instructional design processes, and issues and processes of development, implementation and evaluation. Emphasis will be given to how to identify and solve learning and performance problems.

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## MID917 Designing E-Learning

*https://www.ntu.edu.sg/pace/programmes/detail/mid917-designing-e-learning*

This course explores issues of design in the crafting of learning technologies (i.e., e-learning), activities that foster learning, and overall learning environments. The following topics will be covered: the use of IT tools to support e-learning systems,the design of various instructional strategies used in e-learning system, and e-learning issues.

(Pre-requisite: Completed MID901 and MID941)

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## MID922 E-Learning Tools for Training

*https://www.ntu.edu.sg/pace/programmes/detail/mid922-e-learning-tools-for-training*

In the new information age, many traditional classroom courses or training programmes need to be re-developed and conducted online to meet the needs of adult learners who often have to balance their work demands with their social lives. In this course, the students will learn how to use web-based tools, e-learning authoring tools and produce videos so that they can easily develop and conduct e-learning sessions for teaching and training in practice.

(Pre-requisite: Completed MID901)

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## MID941 Evaluation Model and Methods

*https://www.ntu.edu.sg/pace/programmes/detail/mid941-evaluation-model-and-methods*

This is a core course for MAIDT programme. Programme evaluation is important for instructional design as it 1) helps determine the merit and worth of an instructional package, and 2) helps identify the strength and area for improvement to assist decision making and programme development.

This course is intended to provide students with an understanding and awareness of the basic philosophical, procedural, and technical aspects of evaluation. The primary goal is to help students achieve a level of basic knowledge and skills in the application of acceptable and efficient models to the evaluation of programs. Students will systematically design an evaluation plan as the final project for the course.

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# LEARNING AND DEVELOPMENT

## MDP901 Social and Emotional Development and Assessment

*https://www.ntu.edu.sg/pace/programmes/detail/mdp901-social-and-emotional-development-and-assessment*

This course is one of the two core (required specialization) modules in the Master of Education (Developmental Psychology) programme. The course contains major and classic social and emotional development theories that are fundamental to the participants before they take on other more specialized courses in the programme. It also introduces how to assess children's social and emotional development.

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## MDP902 Cognitive Development and Assessment

*https://www.ntu.edu.sg/pace/programmes/detail/mdp902-cognitive-development-and-assessment*

Children's cognitive development is the emergence of the ability to process information, think, and understand. Understanding children's cognitive development is essential for curriculum development, effective teaching, and good policy making.

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## MDP904 Motivation, Volition and Learning-in-Action

*https://www.ntu.edu.sg/pace/programmes/detail/mdp904-motivation-volition-and-learning-in-action*

This course is designed to empower teachers, coaches, supervisors or parents to motivate their charges and to develop their volition to love, to will, to think and to make personal improvements so that they become happy and well-adjusted members of the community.

The course examines biological-psychological research and theories related to enhancing motivation and volition in young and adult learners. It helps participants to understand why some renowned persons drive themselves to success while others seem to remain in mediocrity. Participants will engage in research practices and reflections as they relate their experiences to theories and hypotheses in daily practices based on the framework of Knowledge-Volition-Action.

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## MDP906 Personality and Attitude Assessment

*https://www.ntu.edu.sg/pace/programmes/detail/mdp906-personality-and-attitude-assessment*

This course covers the non-cognitive aspects of educational assessment. Non-cognitive attributes such as attitudes, interests, and personality are important to education for the 21st century. The course complements those of cognitive assessments, to provide the breadth of knowledge for a MEd (Educational Assessment) specialist.

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## MDP907 How to Nurture Creative and Happy Learners

*https://www.ntu.edu.sg/pace/programmes/detail/mdp907-how-to-nurture-creative-and-happy-learners*

It has been said that we live in the VUCA world – Volatile, Uncertain, Complex, and Ambiguous. Creative individuals will cope well in the VUCA world, due to their capacity to think of original solutions to complex and challenging problems. At the same time, via incremental improvement or radical transformation of the VUCA world they live in, creative individuals can live happy, enriched and meaningful lives in society.

This module infuses its participants with relevant KSAOs (Knowledge, Skills, Abilities and Others) to nurture creative and happy learners in the Singapore context. It achieves this goal by immersing participants in the theoretical and empirical research on creativity and happiness. By mastering this psychological domain of knowledge, participants will become skillful facilitators of creative and happy learners in the classroom, and thereby prepare their students for living and thriving in the VUCA world.

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## MDP909 Assessment and Development of 21st Century Competencies

*https://www.ntu.edu.sg/pace/programmes/detail/mdp909-assessment-and-development-of-21st-century-compe-*

The 21st century is often described as a “VUCA” world — one that is volatile, uncertain, complex, and ambiguous. With new demands coming from the 21st workplace, it is thus imperative for educators in various educational institutions to develop students’ capacities to match the needs of the students’ future workplace. This thus indicates an imperative need to change the way educators craft their lessons and learning tasks so as to provide students with ample opportunities to gain authentic learning experiences and enable the transfer of relevant knowledge and skills from their classrooms to solve real world problems.

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# BITE-SIZED COURSES

## DP907A Discovering My Creative Self: A Psychological Journey

*https://www.ntu.edu.sg/pace/programmes/detail/dp907a-discovering-my-creative-self-a-psychological-journey*

This introductory module is recommended for beginning learners who wish to learn more about the psychology of creativity and employ this knowledge to live and thrive in the VUCA world. Completing this module represents the beginning of a psychological journey to discover the creative self. As Laozi has said: the journey of a thousand miles begins with a single step.

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## DP907B Discovering My Happy Self: A Psychological Journey

*https://www.ntu.edu.sg/pace/programmes/detail/dp907b-discovering-my-happy-self-a-psychological-journey*

This introductory module is recommended for beginning learners who wish to learn more about the psychology of happiness and employ this knowledge to be happy and live the good life. Completing this module represents the beginning of a psychological journey to discover the happy self. To quote Laozi again, the journey of a thousand miles begins with a single step.

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## DP907C Discovering My Creative & Happy Self: Further In & Further Out

*https://www.ntu.edu.sg/pace/programmes/detail/dp907c-discovering-my-creative-happy-self-further-in-further-out*

This introductory module is recommended for beginning learners who wish to learn more about the psychology of happiness and employ this knowledge to be happy and live the good life. Completing this module represents the beginning of a psychological journey to discover the happy self. To quote Laozi again, the journey of a thousand miles begins with a single step.

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## DP909A Principles and Perspectives of Assessing 21st Century Competencies

*https://www.ntu.edu.sg/pace/programmes/detail/dp909a-principles-and-perspectives-of-assessing-21st-century-competencies*

The 21st century is often described as a “VUCA” world — one that is volatile, uncertain, complex, and ambiguous. With new demands coming from the 21st century workplace, it is imperative for educators in various educational institutions to develop students’ capacities to match the needs of the future workplace. This course aims to equip educators with a better understanding of the principles, perspectives and applications of the assessment approaches in helping their students acquire 21st century competencies. By going through this course, educators will be able to develop a deeper understanding of how to effectively align assessment principles and approaches with the teaching and learning process to achieve the intended student outcomes.

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## DP909B Designing Task and Rubric for Assessing 21st Century Competencies

*https://www.ntu.edu.sg/pace/programmes/detail/dp909b-designing-task-and-rubric-for-assessing-21st-century-competencies*

The 21st century is often described as a “VUCA” world — one that is volatile, uncertain, complex, and ambiguous. With new challenges and demands coming from the rapid-changing 21st-century workplaces, it is imperative for educators to develop students to be future-ready. This course aims to equip educators with the principles and practice of assessment task design and rubric development to promote student development of the 21st-century competencies. By going through this course, educators will have the opportunity to work with peers to learn how to design performance-based tasks and scoring rubrics that could effectively aligned with the intended learning outcomes for developing students’ 21st century competencies.

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## DP909C Assessing 21st Century Competencies

*https://www.ntu.edu.sg/pace/programmes/detail/dp909c-assessing-21st-century-competencies*

To enable students to be future-ready in the rapid-changing knowledge-based economy of the 21st century, there is an imperative need for educators to change their way of designing assessment approaches to provide students with ample opportunities to gain authentic learning experiences and enable the transfer of relevant knowledge and skills from the classroom to solve real world problems. This course aims to enhance educators’ assessment literacy in implementing effective assessment decisions and practices to enhance the quality of student learning. By going through this course, educators will gain a deeper understanding of assessment principles and practices to enable them to design appropriate assessment tasks and learning approaches to facilitate their students’ acquisition of 21st century competencies.

# MIND, BRAIN, AND EDUCATION

## MSL901 Foundations in Science of Learning

*https://www.ntu.edu.sg/pace/programmes/detail/msl901-foundations-in-science-of-learning*

The Science of Learning (Sol) frontier draws upon a science- based understanding of the effectiveness of education methods as well as develop new teaching and learning strategies that can lead to actionable and scalable interventions for enhanced learning outcomes.

Rapid developments in neural and physiological imaging technologies afford opportunities for a science-based understanding of the effectiveness of education methods as well as develop innovative pedagogies and classroom practices to realise better learning outcomes of learners.

With an evolving education landscape, there exists a need to contribute to the understanding of the principles and practices that optimally support teaching and learning across the llfe-long learning trajectory- from infant to adulthood, with a focus on enhancing !earning across diverse learner profiles e.g. (at-risk, mainstream) in Singapore's classroom learning environment.

This proposed course aims to address a key gap that exists in the translation of scientific research evidence into pedagogical practice. Specifically, the course will provide participants with the necessary foundational, broadbased understanding in philosophies and theories of the science of learning that draws upon educational neuroscience work. Strong grounding of the theoretical basis for science of learning will facilitate translation pathways of scientific research findings towards innovative learning designs and technological tools that are relevant and useful in current learning contexts.

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**BITE-SIZED COURSES**

## MSL901A Developments in Science of Learning

## MSL901B Cognitive and Affective Science of Learning

## MSL901C The 'science' of Human Learning

## MSL904 Educational Neuroscience: Principles, Perspectives, Practices

*https://www.ntu.edu.sg/pace/programmes/detail/msl904-educational-neuroscience-principles-perspectives-practices*

Advances in imaging techniques, behavioural and psychological research enable the integration of disciplines that investigate human learning, opening up possibilities for the enhancement, update and eventually the reform of educational theories and practices. The field of educational neuroscience and its potential contributions to educational research is now more pronounced than before. Apart from shedding light on brain mechanisms that underpin cognitive and social learning development, research on brain science is also contributing towards neurobiological evidence-based interventions that are addressing educational concerns. These include issues such as i) early learning struggles and early intervention, ii) challenges that individual differences pose, iii) effectiveness of educational and treatment approaches to cognitive struggles and deficits, iv) widening possibilities that brain plasticity brings to normal (e.g. life-!ong learning) and more. Such a neuroscience and education convergence not only carry multiple implications for educational policy but at the same time, foregrounds the mutual benefits of the interaction between neurobiology and education, as education may also conceivably offer a naturalistic framework for research on the brain.

This course is designed to follow the ‘Foundations in Science of Learning’ course, and although it is not necessary to have taken this course previously, students will be expected to undertake some specified pre-reading.

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## BITE-SIZED COURSES

### MSL904A Theories of Educational Neuroscience

### MSL904B Perspectives in Educational Neuroscience

### MSL904C Social Neuroscience

## MSL906 Education at the Intersection of Artificial Intelligence and Neuroscience

*https://www.ntu.edu.sg/pace/programmes/detail/msl906-education-at-the-intersection-of-artificial-intelligence-and-neuroscience*

The human brain is the best example of intelligence known, with unsurpassed ability for complex, real-time interaction with a dynamic world. At the same time, developments in AI are yielding benefits for neuroscientific research. Patterns identified from neural networks can illuminate computations enacted by the biological brain, functioning both as a model for developing and testing ideas about how the brain performs computations. Conversely, brain-activity recordings can be fed to an artificial neural network and tasked with learning how to reproduce the data, functioning as a tool for processing complex data sets that the Science of Learning research field is generating. This course will explore cycles of mutual reinforcement between neuroscientific data and artificial neural networks to obtain further insights into how computation works in the brain, and how machines that can take on more human-like intelligence to advance understanding for how a learner develops. Specifically, the course will focus on unexplored spaces at the intersections of neural AI, symbolic AI, brain science and cognitive science. Takeaways include implications for education and how cutting edge teaching and learning methodologies harnessed from AI and SoL fields may be developed.

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**BITE-SIZED COURSES**

## MSL906A Foundations of AI-enabled Computational Neuroscience

## MSL906B Analyses using AI-enabled Computational Neuroscience

## MSL906C Technologies at the intersections of Artificial Intelligence and Neuroscience

## MSL907 Translating Educational Neuroscience

*https://www.ntu.edu.sg/pace/programmes/detail/msl907-translating-educational-neuroscience*

Efficacious translation from science of learning research to the education practice and policy making continues to have challenges. Educational professionals need to have up to date knowledge of the ethics, feasibility, and challenges of translation to make informed decisions for their students.

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**BITE-SIZED COURSES**

## MSL907A Translational Research: An overview

## MSL907B Ethical concerns of translating Educational Neuroscience

## MSL907C Science of Learning: From theory to Practice

# PHYSICAL ACTIVITY AND HEALTH

## MES906 Exercise Physiology

*https://www.ntu.edu.sg/pace/programmes/detail/mes906-exercise-physiology*

This course explores how the human body responds to acute and chronic physiological demands of sports and exercise. The module will cover energy systems, cardiovascular and respiratory regulation, skeletal muscle physiology and aspects of environmental effects on sports and exercise performance. An integrative approach is adopted to link between basic theories and applied concepts in real life situations. A key focus will be on how research and the underlying exercise physiology principles are relevant to the practitioner. Common assessment techniques with practical applications in sports and exercise physiology will be discussed.

Students will perform laboratory work using state-of-the-art equipment, alongside lectures and tutorials. A mix of face-to-face interactions, online learning and group work is implemented in this module. It is intended that students be guided to holistically integrate the knowledge presented throughout the module.

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## MES910 Physical Activity, Nutrition and Health

*https://www.ntu.edu.sg/pace/programmes/detail/mes910-physical-activity-nutrition-and-health*

This course will equip students with an understanding of the role of physical activity and nutrition in preventing chronic non-communicable lifestyle diseases.

Issues related to measurement are covered before examining the evidence that physical activity and good nutrition can be used to prevent and treat a range of chronic lifestyle diseases.

Physical activity prescription and nutritional recommendations for the prevention of each disease will be examined. The course will use a range of methods to explore the evidence including lectures, laboratory work, tutorials, online learning, group work and presentations.

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## MES911 Psychology of Physical Activity

*https://www.ntu.edu.sg/pace/programmes/detail/mes911-psychology-of-physical-activity*

This course will equip students with an advanced level understanding of psychological knowledge about physical activity for health.

Students will have opportunities to work on physical activity measurements and data interpretation as a part of research experience, alongside lectures and tutorials. A mix of face-to-face interactions, online learning and group work is implemented in this course. It is intended that students be guided to holistically integrate the knowledge presented throughout the course.

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## MES912 Sports Injuries - Understanding, Prevention and Management

*https://www.ntu.edu.sg/pace/programmes/detail/mes912-sports-injuries---understanding-prevention-and-management*

This course is intended to provide the participants with the fundamental knowledge and understanding of sports injuries. The content will also include the types, risk factors, mechanisms, preventive strategies and management approaches to commonly encountered sports injuries. To complete the loop, the course will also include general principles of rehabilitation and decision making criteria for return to sport. Apart from the theoretical aspects, the course will also include practical workshops like sports taping, kinesiotaping and sports massage.

This course will also provide the students with the opportunity to understand the use of emerging technologies like Tensiomyography, NIRS and ultrasound imaging in injury prevention and management. Finally, approaches and strategies for injury prevention, epidemiological research and data analysis will be covered.

The content delivery strategies will include face-to-face interactions, group-based work, team-based learning, use of 3D apps and softwares, and hands-on skill-based workshops to facilitate learning.

The course will focus of applied learning through experiencing real-time injury cases to stimulate the theory-practice bridging of the knowledge acquired.

# PROFESSIONAL TRAINING AND DEVELOPMENT

## MTD903 Instructional Design Models and Practices

*https://www.ntu.edu.sg/pace/programmes/detail/mtd903-instructional-design-models-and-practices*

This course provides participants with an understanding of the process of systematic instructional design and how it can be executed in practice. Participants will explore the pros and cons of different instructional design models. Using an experiential learning approach, participants will execute instructional design projects to analyze, design, develop, implement, and evaluate training they have designed. Students will also examine the instructional design models versus their own workplace practices through online discussions.

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## MTD912 Programme Evaluation Models and Methods

*https://www.ntu.edu.sg/pace/programmes/detail/mtd912-programme-evaluation-models-and-methods*

This course is intended to provide participants with an understanding basic theoretical, procedural, and technical aspects of evaluation. The goal is to help participants develop some basic knowledge and skills in the application of evaluation models to various training programmes

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## MTD908 Training Methods and Strategies

*https://www.ntu.edu.sg/pace/programmes/detail/mtd908-training-methods-and-strategies*

Instructional designers need to have the knowledge of a wide repertoire of instructional theories, methods and strategies in order to address different types of performance gap. This course aims to provide conceptual understanding of the theoretical underpinnings of selected training/instructional methods and strategies. It aims to provide opportunities for students to explore concrete training/ instructional design theories and to design appropriate strategies and/or activities to achieve the instructional objectives. Given a performance problem, the students will be able to apply the instructional theories and approaches to address the needs of the learners and the performance gap.

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## MTD909 E-learning tools for Training

*https://www.ntu.edu.sg/pace/programmes/detail/mtd909-e-learning-tools-for-training*

In the new information age, many traditional classroom courses or training programs need to be re-developed and conducted online to meet the needs of adult learners who often have to balance their work demands with their social lives. In this course, the participants will learn how to use web-based tools, e-learning authoring tools and produce videos so that they can easily develop and conduct e-learning sessions for teaching and training in practice.

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# SCIENCE EDUCATION

## MSC902 Science Curriculum Change and Curriculum Evaluation

*https://www.ntu.edu.sg/pace/programmes/detail/msc902-science-curriculum-change-and-curriculum-evaluation*

The purpose of this course is to provide the participants with opportunities to examine key issues in conceptualisation, enactment and evaluation of the science curriculum, and their implications for research and development.

The participants will learn about the history of changes to the science curriculum around the world. They will examine science standards documents from various countries and make connections to our Singapore science curriculum frameworks. They will unpack the term scientific literacy as discussed in 21 Century Competencies literature and understand its connections to PISA.

With knowledge about the sociopolitical context of science curriculum reform and issues in science reform, course participants will appreciate the usefulness of understanding evaluation perspectives and methods and apply them to design an evaluation study of a school-based science curriculum or programme.

This course is mutually exclusive to MSC902A-C.

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## MSC903 Science as Practice

*https://www.ntu.edu.sg/pace/programmes/detail/msc903-science-as-practice*

This course aims to strengthen the theory and practice nexus of science as practice in science teaching, and enable participants to make connections between the ideas of science as practice to other classroom practices.

This course is mutually exclusive to MSC903A-C.

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## MSC904 Alternative Conceptions and Conceptual Change in Science Learning

*https://www.ntu.edu.sg/pace/programmes/detail/msc904-alternative-conceptions-and-conceptual-change-in-science-learning*

This course introduces constructivist learning theories and conceptual change theories as well as methods to determine alternative conceptions in the context of science learning. It will create greater awareness of the difficulties in learning science, how to diagnose these difficulties, and how to design interventions to address them.

This course is mutually exclusive to MSC904A-C.

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## MSC906 Representations and New Media in Science Education

*https://www.ntu.edu.sg/pace/programmes/detail/msc906-representations-and-new-media-in-science-education*

Learning science involves students making sense of and generating multiple modes of representations (e.g., written text, images and mathematical symbols) that characterise science.

Classroom teachers also make use multiple media and forms of representations to present the subject matter and shape their students conceptual understanding.

This course will offer participants an overview of the theories and analytical tools so that participants are able to examine representations and media that are used in research and in classroom practice.

In addition, participants will apply the theories learned to analyse representational artifacts commonly used in the teaching of science (e.g., diagram, textbook), including the use of new media such as simulation and video to determine their efficacy in supporting student learning.

This course is mutually exclusive to MSC906A-C.

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# BITE-SIZED COURSES

## MSC902A Lessons from the past: Science curriculum reforms and science learning

*https://www.ntu.edu.sg/pace/programmes/detail/msc902a-lessons-from-the-past-science-curriculum-reforms-and-science-learning*

It is important to understand the history of science reforms in order to make sense of current reforms. In this course, participants will learn about the history of science curriculum reforms in Singapore, U.S., and other countries. They will learn to unpack the sociohistorical, socioeconomic, sociopolitical and sociocultural macronarratives in science curriculum and policy documents.

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## MSC902B Overcoming challenges for meaningful science curriculum

*https://www.ntu.edu.sg/pace/programmes/detail/msc902b-overcoming-challenges-for-meaningful-science-curriculum*

There are many challenges in realizing science curriculum reform and these should be well-considered before and during implementation. In this course, participants will learn about the challenges and approaches to science curriculum reform work. They will learn about the different issues that could potentially limit the success of science curriculum reforms. They will also learn about approaches and strategies to address some of these challenges.

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## MSC902C Evaluating science curriculum for improved outcomes

*https://www.ntu.edu.sg/pace/programmes/detail/msc902c-evaluating-science-curriculum-for-improved-outcomes*

Science curriculum should be evaluated for its effectiveness and to inform future changes. In this course, the participants will learn about the different types of evaluation theories and methods that can be applied to evaluating science education (or equivalent) contexts. They will apply what they have learnt to propose an evaluation study.

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## BITE-SIZED COURSES

### MSC903A What is science? - Demystifying science

*https://www.ntu.edu.sg/pace/programmes/detail/msc903a-what-is-science---demystifying-science*

This course delves into the nature of science and scientific knowledge. An in-depth inquiry into the scientific epistemology and the corresponding nature of scientific knowledge provides the basis for discussion of science as practice.

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### MSC903B Drilling deeper: Theories of science as practice

*https://www.ntu.edu.sg/pace/programmes/detail/msc903b-drilling-deeper-theories-of-science-as-practice*

This course builds on MSC903A by examining the various theoretical paradigms that underpins science as practice. The sociocultural, historical and sociopolitical aspects of scientific practices are discussed.

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### MSC903C Overcoming the tensions and challenges for authentic science learning

*https://www.ntu.edu.sg/pace/programmes/detail/msc903c-overcoming-the-tensions-and-challenges-for-authentic-science-learning*

This third course on science as practice aims to link the theoretical ideas and compare them with instructional practices of science as practice in k-12 science classrooms. In this course, participants will view and critique their personal professional knowledge of classroom practice through the theoretical paradigms of science a practice.

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### MSC904A Understanding alternative conceptions in science

*https://www.ntu.edu.sg/pace/programmes/detail/msc904a-understanding-alternative-conceptions-in-science*

Research in science has shown that students, at all levels, when taught science concepts may not understand, partially understand, or even misunderstand them. This course delves into the nature of learning and learning impediments in science which gives rise to alternative conceptions.

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### MSC904B Ways to diagnose alternative ideas in science

*https://www.ntu.edu.sg/pace/programmes/detail/msc904b-ways-to-diagnose-alternative-ideas-in-science*

Student's alternative conceptions will impact their future learning as they will interpret the new learning in based on their prior understanding, giving rise to even more alternative conceptions. This course enables participants to develop diagnostic instruments to identify alternative conceptions in science-related topics so that these alternative conceptions can be addressed during instruction.

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## BITE-SIZED COURSES

### MSC904C Investigating and addressing alternative ideas in science

*https://www.ntu.edu.sg/pace/programmes/detail/msc904c-investigating-and-addressing-alternative-ideas-in-science*

This course requires participants to develop a small-scale study to identify alternative conceptions of their samples in a science-related topic, implement the study and develop an intervention to address the alternative conceptions in a science-related topic determined in their small-scale study.

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### MSC906A Exploring different modes of representing complex ideas in science

*https://www.ntu.edu.sg/pace/programmes/detail/msc906a-exploring-different-modes-of-representing-complex-ideas-in-science*

This course delves into the role of multiple representations in science education. How multiple representations are related to science learning and teaching will be explored based on the overview understanding of multiple representations.

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### MSC906B Making sense of science: Unpacking how science is represented

*https://www.ntu.edu.sg/pace/programmes/detail/msc906b-making-sense-of-science-unpacking-how-science-is-represented*

This course builds on MSC906A by examining the potential of multiple representations in meaning-making processes. The framework for analysing science text and how science text build meaning are discussed.

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### MSC906C Constructing representations for teaching science

*https://www.ntu.edu.sg/pace/programmes/detail/msc906c-constructing-representations-for-teaching-science*

This third course on multiple representation for science learning and teaching aims to construct representations considering its implementation and assessment in science classroom. In this course, participants will analyse science learning using the analytic framework of multiple representation and design a constructing representation activity to support students' science learning.

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# SPECIAL EDUCATION

## MSE902 Human Development

*https://www.ntu.edu.sg/pace/programmes/detail/mse902-human-development*

This course examines the major dimensions of typical and atypical physical, cognitive, moral, emotional and social developments in relation to the patterns of growth, stability and change, which occur across the lifespan.

The impact of biological, psychological, and social challenges on human development will be explored. An ecological perspective will be utilized to understand the individual, family, community, and society issues related to these challenges. A range of developmental learning theories will be introduced to help explain different outcomes in terms of learning, personality, behaviour, mental capacities and processes, and the influences of culture and language.

Alongside the general theories of human development, disability will be introduced through a life course approach to offer an alternative framework for thinking about disability as it affects people of all generations and at all points of life course transition.

This perspective is important, because it highlights how disabling societies and practices affect the population under consideration i.e. children, young people and adults, helping us to understand life course transitions in a collective way, and how this shapes our understanding of disability in the social world.

Participants will be encouraged to link theoretical perspectives and empirical studies with their roles as educators in order to help them develop the necessary understanding and skills to assist others in navigating life's present and future challenges.

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## MSE911 Learning Disabilities

*https://www.ntu.edu.sg/pace/programmes/detail/mse911-learning-disabilities*

This course introduces students to the nature and cause of learning disabilities, and their assessment and intervention.

Students will also have the opportunity to examine the research literature on the effectiveness of various practices as well as learn about the issues and debates in the field. This course provides an in-depth study on learning disabilities to equip students with relevant content knowledge and selected intervention skills to work with learners with learning challenges.
This course is mutually exclusive to MSC903A-C.

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## MSE913 Curriculum Design and Development

*https://www.ntu.edu.sg/pace/programmes/detail/mse913-curriculum-design-and-development*

This course introduces curriculum design and development models and practices pertinent to the field of special education. Students will demonstrate the why, what and how of curriculum design and development. Effective teaching and learning requires a renewed focus on the unique needs of individual learners and an understanding of differentiated curricula and pedagogies to meet the needs of these learners.

This course aims to offer the knowledge and skills to develop appropriate curricula and instructional approaches to accommodate learners with diverse needs ranging from those with high support needs to those who are gifted and talented.
This course is mutually exclusive to MSC903A-C.

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## MSE915 Assessment of Children and Youth with Special Needs

*https://www.ntu.edu.sg/pace/programmes/detail/mse915-assessment-of-children-and-youth-with-special-needs*

This course offers an introduction to assessment and testing of children with special needs. It combines the introduction of the theories and concepts in assessment, with evidence-based practices when assessing children.

Participants in this course will have direct experiences with screening, standardized, criterion-referenced, and behavioral assessment. Through these experiences, they will link the theories and concepts in measurement and child development with the practical guidelines, procedures, and applications. Participants taking this course will understand the different purposes and functions of assessment and important considerations when selecting instruments for assessment of specific purposes.
This course is mutually exclusive to MSC903A-C.

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# TECHNOLOGY FOR TEACHING AND LEARNING

## MLT903 Technologies as Cognitive Tools

*https://www.ntu.edu.sg/pace/programmes/detail/mlt903-technologies-as-cognitive-tools*

One of the effective ways of using technologies to learn is to use technologies as cognitive tools or Mindtools (Jonassen, 2000). Students use Mindtools to construct personal meaning, engage in critical, creative, and complex thinking. Mindtools act as intellectual partners that the students learn with, rather than the traditional computer-assisted instruction where students learn from the computer. Examples of Mindtools include concept mapping tools, and collaborative learning tools. In this course, participants will be introduced to the underpinning learning theories and practical considerations for the use of Mindtools. At the end of the course, participants should be able to use some of the software tools to enhance students' cognition. Participants are expected to engage in critical thinking and collaborative learning in this course.

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## MLT908 Design of Interactive Learning Environments

*https://www.ntu.edu.sg/pace/programmes/detail/mlt908-design-of-interactive-learning-environments*

At the end of the course, participants will be able to: 1. Develop a broad knowledge for ILEs as pedagogical tools 2. Describe the role of ILEs in developing and understanding pedagogical issues 3. Evaluate ILEs from a social and educational point of view 4. Anticipate and address common tensions associated with innovative ILEs in school cultures

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## MLT912 Design for Blended Learning

*https://www.ntu.edu.sg/pace/programmes/detail/mlt912-design-for-blended-learning*

This course introduces the theoretical foundations of blended learning and different forms of blended learning - blended asynchronous learning (e.g., using discussion forums), blended synchronous learning (e.g., using video conferencing), and flipped classroom (e.g., using recorded videos) -and providing practical guidelines on designing the blended learning environment in the school context. The focus of the course is on designing the blended learning environment and facilitating student learning in the environment.

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## MLT913 Technology Supported Assessment

*https://www.ntu.edu.sg/pace/programmes/detail/mlt913-technology-supported-assessment*

This course discusses the tools, design, pedagogy and practices of technology supported assessment to enhance teaching and learning experiences from both cognitive and social constructive perspectives. The course covers pedagogies and approaches in designing assessment and principles for the appropriate use of technology supported assessment. The benefits and challenges, barrier and enablers in technology supported assessment will be also discussed.

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# DRAMA EDUCATION

## MDR901 Theatre Making: Theory, Practice, Pedagogy

*https://www.ntu.edu.sg/pace/programmes/detail/mdr901-theatre-making-theory-practice-pedagogy*

This course addresses the growing interest in the use of drama as a pedagogical tool in schools. It addresses the processes of theatre-making, as well as the theories that accompany them, as creative and engaged participants. It will consequently focus on the understanding of theoretical frames, their translation and applicability to the practice of theatre-making, and the use of such practice in the creative classroom. The course is thus suited for educators who want to develop alternative learning spaces that draw on theatre as a creative and dynamic medium. It requires students to have comprehensive knowledge of the theories introduced and to experiment with theatre as a collaborative art form, as well as participate in dialogical processes of developing a vision for theatre in relation to context and culture. The course will be conducted as a lecture/seminar/practical workshop that involves students in critical reading and analysis, theatre improvisations, group discussions and individual reflection. These are done as both non face-to-face and face-to-face activities.

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## MDR902 Drama Education, Curriculum and Assessment

*https://www.ntu.edu.sg/pace/programmes/detail/mdr902-drama-education-curriculum-and-assessment*

This is a new course for the M.Ed. (Drama) programme and will be a required specialization course. It is a pedagogical methods course and is an integration of 2 old modules Contextualizing Drama Education, and Drama Curriculum as creative Practice. The module covers the basics principles of drama education, drama in the curriculum and assessment in drama.

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## MDR903 The Teacher as Facili-Actor

*https://www.ntu.edu.sg/pace/programmes/detail/mdr903-the-teacher-as-facili-actor*

This course examines the role of the teacher as a reflective and reflexive practitioner, who is both facilitator and actor/performer in her capacity as a collaborative and dialogical educator. It attends to how interactive and participatory learning require teachers to be adaptable to varied styles of learning, and self-aware in relation to multiple cultural dynamics. This entails an ability to improvise and perform multiple roles in order to meet the needs of varied teacher-student dynamics in the 21st century context.

This course responds to the ongoing changes in the education landscape that require teachers to become more engaged in active learning processes that exceed conventional book learning approaches, and embrace holistic, multi-dimensional and inter-disciplinary frames. The arts, particularly drama, is an ideal platform through which to do this, as it is inherently open to change and integrative of multiple knowledges. The teacher as facili-actor can then embody and enact these critical pedagogies and practices.

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## MDR904 Arts-based Research

*https://www.ntu.edu.sg/pace/programmes/detail/mdr904-arts-based-research*

This is a new course that investigates forms of arts-based research and is structured for students doing CI route. It is also an option for those wishing to take a dissertation and explore possible arts-based research methodologies.

# TEACHING AND LEARNING MUSIC

## MUE901 Issues in Music Education

*https://www.ntu.edu.sg/pace/programmes/detail/mue901-issues-in-music-education*

This course provides learners with an understanding of the fundamental guiding principles and issues underlying the teaching and learning of music.

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## MUE902 Philosophy of Music Education

*https://www.ntu.edu.sg/pace/programmes/detail/mue902-philosophy-of-music-education*

To ground music educators with an understanding of the underlying philosophies and assumptions of music education. Approaches include flipped classroom, mobile enabled cooperative learning, inquiry learning, and online class discussions.

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## MUE903 Popular Culture and ICT in Music Education

*https://www.ntu.edu.sg/pace/programmes/detail/mue903-popular-culture-and-ict-in-music-education*

This course is to provide learners with an understanding of the fundamental concepts, ideas and issues in popular music and ICT and the roles they play in the music classroom, through a practical and theoretical framework.

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## MUE904 Studies in Musical Behaviours

*https://www.ntu.edu.sg/pace/programmes/detail/mue904-studies-in-musical-behaviours*

This course is to critically examine and explore properties not only musically but also draw connections in and with philosophy and pedagogical discourses in the practices involving music-creating, performing and responding as well as the site-specific contexts by which these musical practices and traditions are emergent.

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# TEACHING AND LEARNING CHINESE LANGUAGE

MCL902 Topics on Chinese Language and Its Teaching

MCL905 Character and Citizenship Education and its Pedagogy in Singapore Primary Schools

MCL910 Chinese Language Testing and Assessment

MCL911 Application of Information and Communication Technologies in Teaching and Learning of Chinese Language

## BITE-SIZED COURSES

MCL902A Learning of Chinese characters and etymology

MCL902B Learning of contemporary Chinese vocabulary and contemporary Chinese lexical Items

MCL902C Learning of Chinese phonetics and Chinese rhetoric

MCL905A The learning of Character and Citizenship Education (CCE) with Inquiry-based teaching

MCL905B The teaching of Character and Citizenship Education (CCE) out of school

MCL905C The teaching of Character and Citizenship Education (CCE) within the school context

MCL910A Chinese Language Testing and Assessment: Theoretical overview

MCL910B Chinese Language Testing and Assessment: Global perspectives

MCL910C Chinese Language Testing and Assessment: Application in local contexts

MCL911A Designing technology enhanced learning to nurture self directed learning of Chinese Language

MCL911B Designing technology infused formative assessment to improve students' learning of Chinese Language

MCL911C Designing technology enhanced learning (TEL) lessons to support collaborative learning of Chinese Language

# TAMIL LANGUAGE EDUCATION

## MTL901 Tamil Curriculum, Materials including IT: Selection and Evaluation

*https://www.ntu.edu.sg/pace/programmes/detail/mtl901-tamil-curriculum-materials-including-it-selection-andevaluation*

The course will include the Principles, Goals and Selection of a Tamil Language Curriculum, Teaching materials; Evaluation of IT related Curriculum materials and Assessment.

Module focus: Evidence based Research Studies, Teaching and Learning Theories, learning strategies and Development of Language Skills based on a Holistic Second Language Curriculum for Singapore. The first objective is to introduce the concept of the Definition and Meaning of Curriculum and its importance in Educational Development of the Country (i.e. Singapore). The second objective of the course is to explain and map out the links between Planning, Implementing and Evaluating a Curriculum. The third objective is to plan a syllabus for class, level, Mother Tongue Languages department, school and school cluster. The fourth objective is to revise the curriculum to prepare for the next cycle.

This course is mutually exclusive to MTL901A-C.

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## MTL903 Tamil Language in Education

*https://www.ntu.edu.sg/pace/programmes/detail/mtl903-tamil-language-in-education*

This module aims to strengthen students' knowledge on teaching Tamil as a second language in Singapore. The bilingual policy in Singapore will also be covered in the course. The module will elaborate on Language Acquisition, Language Learning theories. Strategies and approaches on teaching Tamil language and developing the four language skills of students effectively will also be elaborated in this module.

This course is mutually exclusive to MTL903A-C.

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## MTL907 History of Singapore Tamil Education and Tamil Literature

*https://www.ntu.edu.sg/pace/programmes/detail/mtl907-history-of-singapore-tamil-education-and-tamil-literature*

The module will focus on the history of Tamil language and Literature teaching over the past 3 centuries. The course will provide an overview of the evolution of Education to deepen students' awareness on Tamil education in Singapore. The module aims to ultimately enable students to adopt strategies for 21st century teaching and learning.

This course is mutually exclusive to MLT907A-C.

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## MTL908 An Introduction to Sociolinguistics and Bilingualism for Tamil

*https://www.ntu.edu.sg/pace/programmes/detail/mtl908-an-introduction-to-sociolinguistics-and-bilingualism-for-tamil*

This course provides the following insights:

1. Understand the concepts of Language Acquisition, Language Learning, Theories in Sociolinguistics and Bilingualism
2. Understand the background of Singapore's official languages, Non-Tamil Indian Languages
3. Know the in-depth meaning of Teaching and Learning First, Second and Foreign Language.
4. Prepare suitable content and interactive lessons to develop the students as confident speakers
5. Understand the Linguistic Features of Standard Spoken Tamil and its development, and the Uses and Users in the Singapore context: education, media
6. Understand the concept of Singapore Tamilians, and making Tamil as a Living Language

This course is mutually exclusive to MLT908A-C.

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## BITE-SIZED COURSES

## MTL901A Conceptualizing Curriculum Design, Development, Planning and Instruction in Tamil Language Education

*https://www.ntu.edu.sg/pace/programmes/detail/mtl901a-conceptualizing-curriculum-design-development-planning-and-instruction-in-tamil-language-education*

This course focuses on the curriculum, the importance of curriculum, dimensions of curriculum, processes behind the planning, construction, and development of curriculum, with the evidence of educational and psychological theories in learning and literacy development.

Colin Marsh and George Willis (2007), state that a curriculum must focus more on the learner than the subject matter and the community. Understanding the key principles and the process of planning and constructing a curriculum will enable a student to review curriculum and to construct a curriculum for current learner centred needs. Curriculum review, planning and development are critical elements in the development and progress of education of a country. Hence, the curriculum has to be prepared with long term planning and the future development of its manpower and workforce. This course provides a general and specific meaning to the concept of Curriculum Planning and Development.

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## MTL901B Strengthening the Links in Curriculum Concepts in Tamil Language Education

*https://www.ntu.edu.sg/pace/programmes/detail/mtl901b-strengthening-the-links-in-curriculum-concepts-in-tamil-language-education*

The course aims to cover the principles, goals and selection of a Tamil Language curriculum, teaching materials; and evaluation of IT related curriculum materials and assessment. This course also aims to strengthen participants' curriculum knowledge pertaining to curriculum, syllabus, textbooks, teaching materials, planning and pre-preparation, enactment of the curriculum, fidelity in classroom teaching and assessment in the context of Teaching Tamil as a Second Language in Singapore.

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## BITE-SIZED COURSES

### MTL901C Understanding, Designing and Reviewing the Tamil Language Curriculum

*https://www.ntu.edu.sg/pace/programmes/detail/mtl901c-understanding-designing-and-reviewing-the-tamil-language-curriculum*

This course includes evidence-based research studies, teaching and learning theories, learning strategies and development of language skills based on a holistic second language curriculum for Singapore. Tamil Language teaching involves textbooks, teaching materials and assessments. Currently the textbooks have been prepared by the Ministry of Education and it is recommended as the main source of teaching and learning in Tamil classes. The package of teaching materials comes with textbooks, workbooks, teaching materials. Student Learning Space provides useful online useful teaching materials. Every lesson has formative assessment. Teachers can develop additional assessments for learning, on learning and of learning.

Schools have summative assessments: at the end of their quarterly, half yearly and annually in the educational year. These assessment papers will provide additional practice work: Table of specimen and answer keys.

Apart from the recommended textbooks, workbooks and teaching materials, teachers have to review ample sources at the market.

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### MTL903A Definition and Concepts of Teaching Tamil as a Second Language

*https://www.ntu.edu.sg/pace/programmes/detail/mtl903a-definition-and-concepts-of-teaching-tamil-as-a-second-language*

This course highlights the Tamil language teaching and learning at second language level. Participants will know about the definitions of first language, Mother tongue language, second language, language acquisition, language learning, bilingualism, additive bilingualism and subtractive bilingualism. They will learn about the journey of Tamil language teaching at second language and the importance of teaching four language skills. Through the Research articles and review reports, they will identify the achievements and challenges in Tamil language teaching and learning as a second language.

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### MTL903B Approaches and Strategies in Teaching, Learning and Assessing Tamil Language

*https://www.ntu.edu.sg/pace/programmes/detail/mtl903b-approaches-and-strategies-in-teaching-learning-and-assessing-tamil-language*

The module aims to deepen students' understanding on the pedagogical approaches in Teaching and learning of Tamil language. It further provides the assessment and evaluation in Tamil Language Education. Students will learn about the theory-practice based pedagogical approaches such as whole language approach, language experience approach, communicative teaching approach, skills based approach, concept based approach, creative pedagogy in teaching Tamil language to their students. They will be able to learn about the Summative and formative assessments and how to encourage students to learn Tamil language with sustained interest. Students will learn about Assessment of learning, Assessment for learning and assessment on learning.

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## BITE-SIZED COURSES

### MTL903C Building and Developing Tamil Teacher Capacity

*https://www.ntu.edu.sg/pace/programmes/detail/mtl903c-building-and-developing-tamil-teacher-capacity*

The course aims to deepen course participants' understanding on how to develop a Tamil teachers' capacity. Course participants will learn about the teacher training, pre-service and in-service training, courses offered to the teachers from the certificate, diploma, post-graduate diploma and degree levels.

Participants will know about the Master's and research level capacity building for the Tamil teachers. This course will look into the knowledge sharing practices and confidence building opportunities for Tamil teachers in building and enhancing the capacity in Singapore Tamil education.

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### MTL907A Teaching Tamil Language with Singapore Historical Perspectives

*https://www.ntu.edu.sg/pace/programmes/detail/mtl907a-teaching-tamil-language-with-singapore-historical-perspectives*

The course aims to deepen students' understanding on the history and journey of Tamil language teaching and learning in Singapore. The course focuses on the history of Tamil language and Literature teaching. The course provides an overview of the evolution and development of Education to deepen students' awareness on Tamil education in Singapore. Ultimately, the course aims to enable students to adopt strategies for 21st century teaching and learning.

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### MTL907B Implications on Teaching Tamil Language from Reviews and Reports

*https://www.ntu.edu.sg/pace/programmes/detail/mtl907b-implications-on-teaching-tamil-language-from-reviews-and-reports*

This course provides an in-depth explanation on the Impact of the Reviews and Review Reports conducted in Tamil Language teaching and learning: MOE and NIE. When there is a review initiative, the whole community including people from all walks of lives were involved in it. Through this course, participants will be able to understand the school based Tamil reviews and nation based major reviews in Tamil and Mother Tongue Languages and their Implications in Tamil education.

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## BITE-SIZED COURSES

### MTL907C Teacher Training to Teacher Upgrading in Tamil Language and Literary Education

*https://www.ntu.edu.sg/pace/programmes/detail/mtl907c-teacher-training-to-teacher-upgrading-in-tamil-language-and-literary-education*

This course provides an in-depth explanation and discussion of the development of Teacher Training, Teacher Education and Tamil Teacher Education. In Singapore, while Tamil is one of the official languages, the Tamil teacher is the key role model for developing the Tamil Speaking community. Developing the professional qualities of a Tamil teacher is an ongoing initiative both of NIE & MOE. Participants will discuss national educational initiatives, critical training programmes that has developed current Tamil Teacher Education Programmes. Through this course, participants will have an understanding of the evolution and development of Tamil teacher Education in Singapore, national Tamil teacher education programmes, theory-practice nexus, the role of teachers' practicum. Teachers undertaking studies, Action Research in the classroom, and contributions to the community will be discussed in the module.

It also involved in-depth discussion on the teaching and learning of Tamil literature in Singapore:

- Singapore Tamil literature Writings: pioneer writers, mass media, schools, community organisations and universities
- School based courses on Tamil Literature
- The development of Tamil teacher capacity to teach Literature
- Speak Tamil Campaign and Tamil Language Festival
- New Initiatives and courses at the Umar Pulavar Tamil Language Centre

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### MTL908A Language, Language Acquisition and Learning in Tamil Language

*https://www.ntu.edu.sg/pace/programmes/detail/mtl908a-language-language-acquisition-and-learning-in-tamil-language*

This course provides insights on theories of what is language, why language is important for an individual's and nation's overall development, and what is the in-depth meaning of language acquisition and language learning. Participants will be given case studies and scenarios to analyse and understand relevant concepts.

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### MTL908B Promoting Tamil Language in Multilingual Singapore Society

*https://www.ntu.edu.sg/pace/programmes/detail/mtl908b-promoting-tamil-language-in-multilingual-singapore-society*

This course provides the following insights:

1. Understand the definition and meaning of teaching Tamil Language as a second language
2. Understand language learning in Singapore and its bilingual policies
3. Acquire relevant skills for the development of the four language skills, and the two way communication skills among students
4. Study the various approaches and strategies in teaching and assessing Tamil Language learning and remedial measures
5. Development of teacher capacity for teaching Tamil language

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## BITE-SIZED COURSES

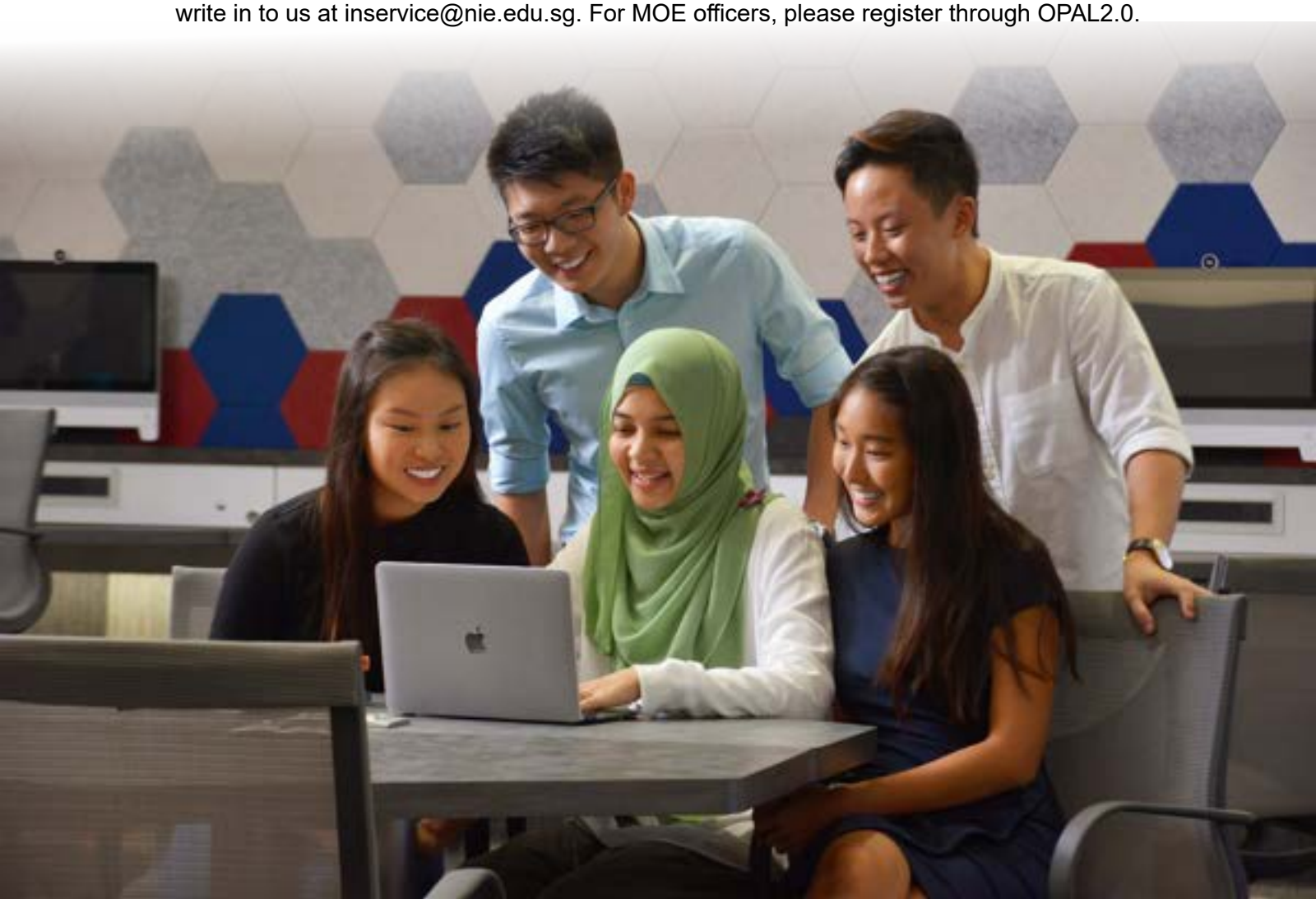
### MTL908C Teaching Tamil Language in Bilingual and Multilingual Education

*https://www.ntu.edu.sg/pace/programmes/detail/mtl908c-teaching-tamil-language-in-bilingual-and-multilingual-education*

Course participants will be able to get current research inputs on home language use, First Language, Second Language, Mother Tongue Language, Bilingual Education, Standard Spoken Tamil, Pedagogy, Media language Use, Future Singapore Tamilian and making Tamil a Living, Cultural Heritage.

# STANDALONE PROFESSIONAL DEVELOPMENT COURSES

NIE has curated a suite of professional learning courses to support the continual development of educators and professionals working in education. To register for our courses, please visit us at https://place.nie.edu.sg/ or write in to us at inservice@nie.edu.sg. For MOE officers, please register through OPAL2.0.



## IVP0022 Inclusivity and Accessibility: A Practical Course on Art Teaching and Making in SPED.

*Duration: 26 hours*

Participants will be introduced to the MOE Visual Arts Special Education (SPED) teaching and learning syllabus through hands-on engagement with two dimensional, three dimensional and digital practices in art education whilst exploring research, philosophy and pedagogy in these areas. The course will use reflexive e-pedagogies to encourage participants to interweave ideas from the 4Cs (Communication, Creativity, Critical Thinking & Collaboration) and 4Es (Exploration, Engagement, Execution & Expansion) and connect theory, practice and research in order to deepen their understanding and expertise in delivering art education provision to SPED learners. Referencing the 4 focus areas in the VA SPED syllabus (About me, My immediate environment and me, Singapore and me, The world and me), participants will generate their own artworks, trial art techniques in their own settings and learn to work independently as well as collaboratively to develop lesson plans and assessment strategies.

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## IVP0023 Essentials of Teaching and Learning

*Duration: 40 hours (including e-learning)*

Essentials of Teaching and Learning is a course designed for Teaching-Artists working in the Singapore schools. Combining both asynchronous and synchronous online teaching approaches, this course equips Teaching-Artists with the skills and knowledge to conduct arts programmes in schools. This course consists of five parts:

- Psychology of Learning
- Curriculum Planning
- Lesson Planning and Assessment
- Facili-Acting
- e-Pedagogy

It seeks to introduce Teaching-Artists to key concepts in teaching and learning, and the common language used in education for better communication with key stakeholders in schools. In addition, it prepares the Teaching-Artists for the digital arts classrooms and skills in facilitating arts learning.

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# ASSESSMENT

## ICT0300 Assessment Literacy in the Primary/Secondary Classroom

*Duration: 14 hours*

This course helps primary/secondary teachers clarify their understanding of assessment, teaching and learning within the context of Singapore's 'Holistic Assessment'/'Balanced Assessment' aspiration. They should be able to develop an assessment plan with suitable emphasis on assessment for learning at the departmental or school-wide level to build coherence of formative and summative assessment practices.

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## ILA0002 Designing Alternative Assessment

*Duration: 3 hours (including e-learning)*

This course is targeted at getting participants to be proficient in designing such assessments. It aims to achieve this by suggesting a framework as well as providing many examples to illustrate course content. It is offered as 100% online so that participants can attend it at their own time or as a whole school/institution where participants can discuss off-line after each session with the supporting reflection questions.

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## ILA0008 Designing Quality Alternative Assessments and Associated Rubrics

*Duration: 8 hours (including e-learning)*

There is a growing recognition that we need a variety of assessment types in schools. These different assessment methods will help bring balance to the emphasis on conventional paper-and-pen tests as well as cater to diverse student abilities and cover a wider range of learning outcomes. Careful consideration is therefore required in evaluating and selecting alternative assessments that can deliver on these intended outcomes. Frameworks for designing alternative assessments and rubrics will be presented in this course. Participants will also be introduced to the salient issues involved in such alternative assessments. At the end of the course, participants will be able to make informed choices based on fundamental assessment principles.

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## ILA0011 Designing Quality Assessment in support of AfL

*Duration: 3 hours (including e-learning)*

Assessment is integral to the learning process. It should begin with clarity of purpose and gather information to inform future practices. The quality of the evidence of student learning is, however, only as good as the design of the assessment. This fully asynchronous course is designed to build teachers' assessment literacy in the area of designing classroom assessment tasks to elicit quality evidence of student learning. Design considerations of validity, reliability, and fairness will be introduced to enable participants to evaluate and redesign their current school-based assessment tasks and rubrics to elicit quality evidence of student learning to address learning gaps.

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## ILA0012 Designing Quality Questioning in support of AfL

*Duration: 3 hours (including e-learning)*

This fully asynchronous course is designed to build teachers' assessment literacy in the area of exploring the process of learning through questioning, an important practice in Assessment for Learning (AfL), and is grounded within the context of the Singapore Teaching Practice. The course begins with understanding differentiated student outcomes defined by an evidence-based taxonomy, Structure of Observed Learning Outcomes (SOLO), to inform the design of a hierarchy of questions to advance student learning. Research-informed best practices for enacting effective questioning using authentic scenarios will be introduced to enable participants to plan essential questions, hinge questions, and design assessment in their specific contexts to diagnose and address learning gaps.

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## ILA0013 Designing Quality Feedback in support of AfL

*Duration: 3 hours (including e-learning)*

This fully asynchronous course is designed to build teachers' assessment literacy in the area of feedback, an important practice in Assessment for Learning (AfL), and is grounded within the context of the Singapore Teaching Practice. The course begins with understanding the fundamentals of effective feedback. Research-informed best practices for effective feedback using authentic scenarios will be introduced to enable participants to design an extended feedback model involving feedup, feedback, and feedforward processes in their specific contexts to engage students in quality feedback and support them in moving their learning forward.

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## ILA0015 Designing and Using Rubrics for Workplace Training and Assessment

*Duration: 8 hours (including e-learning)*

This course offers insights into the design and use of quality rubrics for training and assessment in workplace settings. It introduces different types of rubrics and the principles guiding rubric design. Participants would explore the possibility of using rubric-based assessment and have hands-on experience designing or refining rubrics based on an informed understanding of their workplace contexts.

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## ILA0016 Authentic Assessments for Workplace Contexts

*Duration: 8 hours (including e-learning)*

This course offers insights into the design and use of authentic assessments in workplace settings. It examines the notion of authenticity in assessment and discusses the importance of authentic assessments. Additionally, it puts forth relevant principles to guide the design of authentic assessments in workplace contexts.

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## ILA0022 Assessment Leadership in Schools: Policy & Practice

*Duration: 8 hours (including e-learning)*

Assessment leadership is the application of assessment literacy to inform educational decision-making and change management. Assessment literacy and leadership are recognized priorities locally and globally. In Singapore, this prioritization is embodied in policy initiatives such as PERI Holistic Assessment, Balanced Assessment, and Learn-for-Life. This blended course aims to develop the capacity of participants in leading assessment change in the context of these and other emerging assessment initiatives.

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## ILA0023 Effective Questioning and Feedback: Best Practices for AfL

*Duration: 8 hours (including e-learning)*

This blended course is designed to build teachers' capacity in the areas of questioning and feedback, two important assessment for learning (AfL) practices. AfL practices and understandings will be set within the context of MOE Assessment Philosophy and assessment competencies. Using research-informed best practices, participants explore and apply questioning and feedback within authentic contexts, and examine how they may plan the conditions for ideal questioning and feedback practices. Through discussion, hands-on activities and reflection, participants will enhance their knowledge and skills in using questioning and feedback practices to support and evaluate teaching and learning.

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## ILA0024 Evidence-based Assessment for Learning

*Duration: 8 hours (including e-learning)*

Assessment is integral to the learning process. It should begin with clarity of purpose and gather information to inform future practices. The quality of the evidence of student learning is, however, only as good as the design of the assessment. What are the factors that must be considered in designing quality assessment in a unit of work? What happens after the evidence comes in? How to use assessment results formatively? The answers to these questions connect the assessment design to the intended use of the evidence for the action part of learning. In this blended course, principles in designing quality assessment and developing a unit assessment plan will be examined. Through case scenarios and artefact analysis, participants will learn to apply a principled approach in interpreting and using evidence collected to progress student learning. This course aims to develop participants' capacity in making informed instructional choices through knowing where learning is headed, where it is now, and using evidence to decide what to do next to improve student learning.

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## ILA0029 Assessment for Learning in A-Level Project Work

*Duration: 6 hours*

This course provides PW Key personnel with an understanding of the relevance of assessment for learning to A-Level Project Work. They will also describe ways of designing formative assessment in PW and articulate how formative feedback could be used to address gaps in students' knowledge and skills.

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## ILA0031 Consultations to support school assessment initiatives

*Duration: 7 hours (including e-learning)*

This course involves a combination of big group lectures and/or small group advisement in schools embarking on assessment initiatives (e.g., feedback). It is highly customised to school's needs.

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## ILA0032 Understanding and applying Success Criteria

*Duration: 7 hours (including e-learning)*

This blended course seeks to clarify and deepen understanding of success criteria so that they can be used productively to design more focussed lessons, assessment tasks, feedback, and student self-assessment.embarking on assessment initiatives (e.g., feedback). It is highly customised to school's needs.

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## ILA0034 Tech-enhanced Student Assessment Literacy

*Duration: 7 hours (including e-learning)*

This course will focus on developing student capacity to play a more active role in assessments. It will present a set of practices that begins with pre-assessment task activities to types of feedback as well as post-feedback lesson design. This workshop will also suggest how commonly used technological apps or platforms (e.g., SLS)can enhance or transform the student experience.

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## ILA0038 Tech-enhanced AfL

*Duration: 3 hours (including e-learning)*

Much has been written and said about how today's young learners are growing up surrounded by information technology and digital media. As such, it may make sense to leverage on technology to engage them in learning. This course serves as an introduction for teachers who are just beginning to consider using technology in lessons. It will explore how simple technological tools can facilitate assessment for learning (AfL) and how teachers can intentionally select and design lessons that use technology to enhance student learning. The course aims to achieve this by focusing on various aspects of AfL and showing examples of how school teachers are using technology in each of these aspects. It will also introduce the SAMR framework. It is hoped that at the end of the course, participants will feel equipped and inspired to try using tech to support AfL in class.

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## ILA0039 Student Self-Assessment: 5 Ws and 1 H

*Duration: 8 hours (including e-learning)*

This Student Self-Assessment workshop hopes to provide teachers with a better understanding about student self-assessment (what) and its potential benefits to teachers and students (who and why). The workshop will look at how to set the stage for the implementation of self-assessment in the classroom (where), introduce a variety of self-assessment strategies (what and how) as well as discuss the issues and challenges of implementing student self-assessment (when and how). There will also be a hands-on session for teachers to work together to co-design self-assessment for their students' use.

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## ILA0040 Nurturing Self-Regulated Learners through Assessment Practices

*Duration: 8 hours (including e-learning)*

This workshop hopes to provide teachers with a better understanding of self-regulated learning (SRL). It will focus especially on shaping classroom assessment practices to nurture SRL, as well as discuss the complexities involved. There will also be many hands-on opportunities for teachers to plan for application of course content in their lessons.

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## IS0003 Designing Differentiated Assessments

*Duration: 6 hours (including e-learning)*

Our students have diverse learning needs and bring with them a wide range of experiences, beliefs, knowledge, and skills. Teachers need to adapt not only teaching pace and approaches but also assessment practices that support the learning of students with different profiles.

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## ICT0100 Introduction to Lesson Study

*Duration: 7 hours*

This course will introduce lesson study as an ongoing, teacher-led, professional learning process that will develop teachers' capacities and dispositions as they discuss curriculum and subject matter, pedagogy, assessment, student learning, and other related issues. Participants will explore the various stages of the lesson study cycle from unit and lesson planning (PLAN), research lesson implementation (DO), observation (SEE), post-research lesson discussion and refinements made to the research lesson (IMPROVE) vicariously through the use of video cases. The benefits and challenges in implementing lesson study will also be explored.

## ICT0102 Experiencing Lesson Study

*Duration: 7 hours*

This course provides the opportunity for teachers and school key personnel to experience a real live research lesson (RL) observation and post RL colloquium. Throughout this experience, participants will learn how to observe with a focus on student learning and be exposed to a variety of observation tools. They will discuss their observations in a post RL colloquium, supported by experienced faculty members of NIE and other resource persons as "knowledgeable others". This course is offered mainly as a school-based workshop but it can also be cluster-based with teachers and key personnel from different schools. As part of the workshop will involve observing a real live RL, the course facilitator will work with a team of teachers in crafting the RL. Arrangements for crafting the RL will be discussed further with the course facilitator.

## ICT0105 Equipping Facilitators for Lesson Study

*Duration: 7 hours*

This course provides the opportunity for teachers and school key personnel who are involved in facilitating and leading lesson study (LS) cycles in their own school, to clarify their conceptions and discuss how to continue with and sustain the LS journey. In this course, LS facilitators will discuss challenges of implementation of LS in their own school, and how to steer the discussion in a lesson study cycle. The depth of discussion in this course will depend on the questions raised from the experience of involvement in previous LC cycles by the participants. As such, this course will only benefit participants who have been involved in LS.

## ICT0202 Differentiated Instruction for Diverse Learners

*Duration: 14 hours (including e-learning)*

This course provides an overview of differentiated instruction (DI), and its basic principles and components. It aims to help participants develop an understanding of different learner needs and interests in the regular classroom. The teachers will explore the principles and practices of differentiated instruction and learn to cater to these needs using DI principles and strategies. As part of the course, participants will also adapt and differentiate activities/materials to meet varied learning needs and interests. Participants will analyse and discuss issues in implementation, as well as solutions to problems inherent in a differentiated classroom. The roles of teachers will be examined and possible challenges will also be discussed.

## ICT0221 Accommodating diverse learners

*Duration: 10 hours (including e-learning)*

By the end of the course, participants will acquire knowledge and skills in collecting social and behavioural data, and using practical strategies to accommodate diverse learners. This course will benefit teachers in PLC teams as well as teachers who are interested in improving their teaching practices in our diverse classrooms today.

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## ICT0413 Engaging Pedagogies

*Duration: 7 hours*

This course will introduce participants to the practice of dialogic argumentation. We explore the theory of how social argumentation mirrors individual thinking and is thus a productive path to developing 21st century dispositions and thinking values. The curriculum is a structured approach designed to help students debate broad issues represented by 2 opposing perspectives. Research evidence shows that repeated practice of dialogic argumentation improves students' expository essay writing, as expository essay writing requires a high level ability to integrate multiple perspectives and evidence. Participants will engage in dialogic argumentation with each other in order to better understand the argumentation process. Time will also be set aside for participants to discuss issues of implementation in the classroom.

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## ICT0417 Design Thinking: Tools and Methods

*Duration: 14 hours*

This course introduces participants to the concept of design thinking, as well as a basic set of design thinking tools and processes. Participants will learn by doing: working in groups of 4-5, participants will immediately put into practice the tools and processes they have learned as they attempt to create innovative solutions to solve a real-world human problem. They will interact with people who experience the problem on a daily basis to acquire a deep understanding of their needs and challenges; they will develop and refine their solutions on the basis of feedback from their fellow learners and guests. The course ends with a brief exploration of possible ways of applying design thinking tools and processes in Singapore schools, as well as some of the challenges involved.

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## ICT0419 Dialogic Argumentation: Development of Thinking and Expository Writing

*Duration: 7 hours*

This course will introduce participants to the practice of dialogic argumentation. We explore the theory of how social argumentation mirrors individual thinking and is thus a productive path to developing 21st century dispositions and thinking values. The curriculum is a structured approach designed to help students debate broad issues represented by 2 opposing perspectives. Research evidence shows that repeated practice of dialogic argumentation improves students' expository essay writing, as expository essay writing requires a high level ability to integrate multiple perspectives and evidence. Participants will engage in dialogic argumentation with each other in order to better understand the argumentation process. Time will also be set aside for participants to discuss issues of implementation in the classroom.

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## ICT0509 Data-Driven Conversations in Professional Learning Teams

*Duration: 11 hours (including e-learning)*

This is a hands-on skills development course, conducted in the computer lab at NIE. The objective of this course is to gain practical experiences in applied statistics for educational research. The aim of the course is to provide participants with the skills to confidently conduct a basic repertoire of statistical data analyses and interpret the results in light of their inquiry project.

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## ICT0513 Introduction to Qualitative Research

*Duration: 7 hours*

This course offers a step-by-step approach to developing usable research plans for small-scale studies by teachers and other child professionals. It debunks the myth that qualitative researchers always have to muddle through their studies. Instead, we examine how to systematically identify topics, write research questions, articulate professional stances, and select methods of sampling, data collection, and analyses. By the end of this course, you would be more informed about designing qualitative studies with creativity and an openness to true discovery.

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## ICT0514 Qualitative Data Collection & Analyses

*Duration: 11 hours*

This hands-on course focuses on the basics of qualitative data collection, analyses, and reporting of findings. We go through the motions of in-depth individual and group data collection, including online options. Using mock data sets, you will get a taste of analyses, along with dilemmas faced by even veteran researchers. A third feature of this course gives a glimpse of options for effectively communicating findings and recommendations to fellow professionals, parents and even children. At the end of the course, you would be better equipped to conduct qualitative studies.

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## IPL0012 Teacher Leadership for Effective PLC Facilitation

*Duration: 12 hours*

Professional Learning Communities (PLCs) have become increasingly popular in the local education scene. This is not surprising bearing in mind that PLCs, when done right, has the potential to increase the collective capacity of school organisations. At a more microscopic level, PLCs have immense potential to bring about the development of teacher knowledge, and thus having an impact on improvements in teacher teaching practice, student learning, and student learning outcomes. However, this sequence of school improvement is very much dependent on the quality of teacher learning that takes place in PLCs. Just as the quality of teacher learning can vary from one mentoring relationship to another and from one workshop to another, the quality of teacher learning in PLCs will expectedly vary from one PLC to another. PLCs, like any other group situation, are and cannot be devoid of leadership – in this case, teacher leadership, given that the members of PLCs usually and predominantly consist of teachers. The quality of teacher learning is therefore reliant on the quality of teacher leadership. This assertion, however, begs further questions. Who are the potential candidates for teacher leaders in PLCs? What are the knowledge, skills and disposition that teacher leaders ought to have? How are they to be developed? The series of workshops planned for this course seek to provide the learning spaces for potential teacher leaders to hone in and sharpen their knowledge, skills and disposition on teacher leadership to bring about positive teacher learning in PLCs. By the end of the course, teacher leaders will be able to: 1) Articulate the key features of PLCs, 2) Identify the key characteristics of teacher leadership, 3) Unpack the effects of teacher leadership in PLCs on teacher knowledge, teacher teaching practice, student learning, and student learning outcomes, 4) Outline and demonstrate the concepts and principles of teacher leadership in PLCs, 5) Specific and demonstrate the 3 stages of PLC participation, 6) Articulate and demonstrate the 5 PLC conversation questions, 7) Enunciate and demonstrate the 7 PLC conversation activities. The modes of learning include lecture, group discussions, demonstrations, exemplars, and simulations.

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## IPL0023 Designing and Facilitating an Envisioning Journey

*Duration: 9 hours*

Train selected key personnel to facilitate an envisioning conversation at the appreciative summit

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## IPL0024 Promoting Mindfulness in Schools

*Duration: 12 hours*

Students around the globe have been besieged by disruptions that threaten not only their academic learning but also their mental, emotional and interpersonal well-being. In the midst of pressing and mounting challenges, how can schools ensure the total wellness of all their students? Beyond reactive, piecemeal, and short-term measures, how can schools enact mindful education that pays attention to wholeness in every student? This course introduces participants to the key ideas, theories and recommended approaches surrounding mindfulness. Participants will acquire an appreciation of how mindfulness can be promoted through the school mission, ethos, community, curriculum, teaching and learning.

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## IPL0025 Change Leadership: Overview and Implications.

*Duration: 4 hours*

Many leaders need to lead change. Organisations are undergoing change to adapt better to their operating environment.  Some launch initiatives to develop themselves into “learning organisations” or “innovative organisations”. Change Leaders need to develop and inspire their followers towards a shared vision, lead and manage change. This workshop explores change leadership in the VUCA environment, the implications and what needs to be done, moving forward. It shall address the challenges of change leadership, and how beneficial change can be derived from the foundation of deep learning. It also discusses how a leader can lead an organisation so that it can change in areas of high payoff and develop a platform where innovation can be sustained.

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## IPL0026 Change Leadership: Overview, Implications, and Applications

*Duration: 6 hours*

Many leaders need to lead change. Organisations are undergoing change to adapt better to their operating environment.  Some launch initiatives to develop themselves into “learning organisations” or “innovative organisations”. Change Leaders need to develop and inspire their followers towards a shared vision, lead and manage change. This workshop explores change leadership in the VUCA environment, the implications and what needs to be done, moving forward. It shall address the challenges of change leadership, and how beneficial change can be derived from the foundation of deep learning. It also discusses how a leader can lead an organisation so that it can change in areas of high payoffs and develop a platform where innovation can be sustained. Practical applications of the learning on Change Leadership in the various domains will be explored. The practical exercises serve to support deep learning and address the unique needs of the work of Change Leaders towards leadership transformation.

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## INS2139 Design-and-Make I (Randomness!)

*Duration: 24 hours*

This is one of the three Design-and-Make in-service courses to support the teaching and learning of Design & Technology (D&T) at the lower secondary level. The three courses are standalone and they cover three fundamental design techniques necessary for the implementation of the lower secondary programme, namely, Design-and-Make I (Randomness!); Design-and-Make II (Shape borrowing!); and Design-and-Make III (SCAMPER!). The main objective of the three courses is to ground D&T teachers in the practice by going through exercises and practices first as a teacher-designer and second as a D&T pedagogue.

You will be assessed for this course.

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## INS2140 Design-and-Make II (Shape Borrowing!)

*Duration: 24 hours*

This is one of the three Design-and-Make in-service courses to support the teaching and learning of Design & Technology (D&T) at the lower secondary level. The three courses are standalone and they cover three fundamental design techniques necessary for the implementation of the lower secondary programme, namely, Design-and-Make I (Randomness!); Design-and-Make II (Shape Borrowing!); and Design-and-Make III (SCAMPER!). The main objective of the three courses is to ground D&T teachers in the practice by going through exercises and practices first as a teacher-designer and second as a D&T pedagogue.

You will be assessed for this course.

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## INS2141 Design-and-Make III (Scamper!)

*Duration: 24 hours*

This is one of the three Design-and-Make in-service courses to support the teaching and learning of Design & Technology (D&T) at the lower secondary level. The three courses are standalone and they cover three fundamental design techniques necessary for the implementation of the lower secondary programme, namely, Design-and-Make I (Randomness!); Design-and-Make II (Shape Borrowing!); and Design-and-Make III (SCAMPER!). The main objective of the three courses is to ground D&T teachers in the practice by going through exercises and practices first as a teacher-designer and second as a D&T pedagogue.

You will be assessed for this course.

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## INS2142 Refresher on Machining Skills I (Meranti – Mild Steel)

*Duration: 18 hours*

This Refresher on Machining Skills I in-service course is one of the four 'Refresher on Machining Skills' in-service courses for all D&T teachers and EWIs. As a whole, the main overarching aim of the four courses is to refresh, familiarise and internalise practical knowledge and skills. One would have clocked the essential number of hours of confidence practicing on the machines after completing all the four courses to be competent at entry level. For D&T teachers and EWIs who are new to wood lathe, the basics of handling the machine will be taught. Ancillary but important practical skill exercises on brazing and welding will be carried out.

You will be assessed for this course.

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## INS2143 Refresher on Machining Skills II (Pine/Ash – Aluminium)

*Duration: 18 hours*

This is one of the four 'Refresher on Machining Skills' in-service courses for all D&T teachers and EWIs. As a whole, the main overarching aim of the four courses is to refresh, familiarise and internalise practical knowledge and skills. One would have clocked the essential number of hours of confidence practicing on the machines after completing all the four courses to be competent at entry level. For D&T teachers and EWIs who are new to wood lathe, the basics of handling the machine will be taught. Ancillary but important practical skill exercises on brazing and welding will be carried out.

You will be assessed for this course.

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## INS2145 Refresher on Machining Skills IV (Jelutong – Copper)

*Duration: 18 hours*

This is one of the four 'Refresher on Machining Skills' in-service courses for all D&T teachers and EWIs. As a whole, the main overarching aim of the four courses is to refresh, familiarise and internalise practical knowledge and skills. One would have clocked the essential number of hours of confidence practicing on the machines after completing all the four courses to be competent at entry level. For D&T teachers and EWIs who are new to wood lathe, the basics of handling the machine will be taught. Ancillary but important practical skill exercises on brazing and welding will be carried out.

You will be assessed for this course.

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## INS2162 Facilitating Pupils in Designing in the 2019 D&T US T&L Syllabus

*Duration: 80 hours*

Facilitating secondary school pupils in designing demands an understanding of the design process in-action at the secondary school level. Teacher-as-designer; teacher-pupil designer-coach in-action; and building of a culture of creative-self in teacher and in pupil are three broad practices that intertwined in the design process in-action, and influence the way to facilitate pupils in designing. They comprise a range of unique pedagogical acts necessary for an effective facilitation process. This course educates and trains D&T teachers to facilitate pupils in designing using this range of pedagogical acts underpinned by the Singapore D&T education philosophy and centred on the 2019 D&T Teaching & Learning Syllabus for Upper Secondary.

You will be assessed for this course.

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## INS2176 Electronics – Designing and Making Fun Projects

*Duration: 18 hours*

Electronics can be taught in engaging ways that spark and sustain learning. This in-service course seeks to support the teaching and learning of electronics through designing and making projects that are fun, wholesome and involve play while promoting learning. Participants will be exposed to pedagogical ways of applying electronics for a variety of purposes that centers on play. This course is suitable for Design and Technology (D&T) teachers as well as those teach the Electronics elective at the upper secondary level.

You will be assessed for this course.

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## IEL0024 An Introduction to Film Studies

*Duration: 14 hours*

Film is arguably the lingua franca of communication today. From advertisements to TikTok to propaganda, film is popular, powerful and prevalent. As both consumers and producers of film, it is imperative that we learn about the digital techniques and strategies involved in how it can be used to tell stories and to persuade. The focus of the course is on film both as art and narrative and a medium of representation and persuasion, paying particular attention to aspects of film form, aesthetics and style. In this course, we will learn about the four elements of film: mise en scène, cinematography, editing and sound. We will then examine how equipping ourselves with critical visual media literacy will help us be more aware of how we make meaning from film.

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## IEL0030 Design your Video Resume

*Duration: 14 hours*

An emerging trend in the digital communication environment today is the growing popularity of video resumes. Such digital artefacts provide potential employers a quick sense of the identity, values, and ideas of the prospective jobseeker. A compelling digital resume helps one to stand out from the crowd and demonstrates a strong level of digital fluency – valued by many employers today. In this course, participants are guided in designing their digital product from a multimodal communication (Bezemer & Kress, 2015) and semiotic technologies (van Leeuwen, Djonov & O'Halloran, 2013; Lim 2021) perspective. A design thinking approach (Stanford d.school) is adopted to scaffold the creation and performance of a digital presentation of the self. The goal is for participants to produce dazzling short introductory videos of themselves that can be used to accompany their digital resumes.

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## IEC0121 Effective Parent-Teacher Communication

*Duration: 10 hours*

The course provides participants with an opportunity to reflect and consolidate understanding of the common types of challenging behaviours (e.g., self-injury, aggression) encountered in primary school settings and their possible underlying reasons/functions for those students concerned. Some research dispelling the popular wisdom that people can freely control their behaviours, suppress their impulses , conquer their temptations, or overcome their vices if only they put their mind to it or try harder and persist will be shared and evaluated. What makes sense based on self-regulatory strength research for AEDs to support students with challenging behaviours will be worked on. Participants will also work on using Functional Behaviour Assessment (FBA) to develop a behavior intervention plan (BIP) for implementation.

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## IEC2024 Managing Challenging Behaviours for Secondary School AED(LBS)

*Duration: 24 hours*

The course provides participants with an opportunity to reflect and consolidate understanding of the common types of challenging behaviours (e.g., self-injury, aggression) encountered in secondary school settings and their possible underlying reasons/functions for those students concerned. Some research dispelling the popular wisdom that people can freely control their behaviours, suppress their impulses, conquer their temptations, or overcome their vices if only they put their mind to it or try harder and persist will be shared and evaluated. What makes sense based on self-regulatory strength research for AED(LBS)s to support students with challenging behaviours will be worked on. Participants will also work on using Functional Behaviour Assessment (FBA) to develop a behavior intervention plan (BIP) for implementation.

You will be assessed for the course.

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## IEC4008 High Ability in Learners: Understanding and Providing for Them in the Regular Classroom

*Duration: 26 hours*

This course seeks to help teachers' gain a deeper understanding of high-ability learners (HALs), to develop an informed awareness of the learning needs of HALs; and begin to provide for the needs of highly able pupils in regular classrooms. Topics will include an overview of the cognitive and affective traits as well as learning needs of high-ability learners; conceptions of intelligence and giftedness; issues around the identification and assessment of learning potential; and the rationale for differentiated instruction; Participants will be acquainted with some methods of instructional modification and strategies for engaging learners with high ability and for enhancing their learning in mixed-ability settings.

You will be assessed for the course.

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## IPD0174 Principal Matters +

*Duration: 120 hours*

The programme aims to strengthen participants' leadership capacity to negotiate the ongoing tensions arising from leading EC educational institutions that are simultaneously (1) a community where learning happens, (2) an educational institution that operates within the Singapore context and its structures, and (3) a business that needs to be financially viable.

Through this programme, participants have opportunities to develop skills, knowledge and dispositions in negotiating the ongoing tensions through learning experiences in the four strands of leadership, community, educational institution, and business. At the same time, PM+ provides both structure and flexibility to enable participants to create their own meanings from their shared PM+ experiences and make sense of these experiences in the context of various leadership roles and levels among the different participants profiles. Meaning-making will emerge from engagement in two inter-weaving adventures, i.e. the individual development adventure and the team project.

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## IPD0175 Inclusion Matters

*Duration: 144 hours*

The programme provides facilitated opportunities for leaders from different segments of the special and inclusive education ecosystem to come together to better understand each other's vision, practices and challenges. Participants will be encouraged to engage in critical reflection of themselves as individual leaders as well as leaders of an interconnected network of stakeholders in a system.

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## IEL0007 Pedagogical Grammar of English

*Duration: 24 hours (including e-learning)*

At the end of the course, participants will be able to:
i) understand the key concepts, theories and issues related to the study of grammar
ii) understand the knowledge, skills and metalanguage to understand, analyse and articulate basic patterns of English sentence structure.
iii) to understand how to apply the study of grammar to pedagogy

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## IEL0022 Creating Human Interest Stories on Minority Communities in Singapore

*Duration: 8 hours (including e-learning)*

This module supports participants in conceptualizing and writing up a mini-story capsules about how minority communities keep their language and literacy practices alive in Singapore. It also provides support for them to craft and present these stories in interesting ways using multi-modal resources.

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## IEL0023 Singapore English

*Duration: 14 hours (including e-learning)*

Among the 'New Englishes' (McArthur, 1987), 'Outer Circle Englishes' (Kachru, 1982), or 'Post-colonial Englishes' (Schneider, 2007), Singapore English is a fascinating and also well-studied emerging variety of English. Although Singapore English is a product of languages in contact, it is not simply an amalgamation of the languages in its ecology, but is governed by a unique grammar. The course provides an overview of the status and the linguistic features of Singapore English. It also helps participants develop abilities in analysing and describing authentic examples of Singapore English. These practical language-analysis techniques are applicable to fields ranging from English language instruction in Singapore, to language localisation services, such as translation.

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## IEL0024 An Introduction to Film Studies

*Duration: 14 hours*

Film is arguably the lingua franca of communication today. From advertisements to TikTok to propaganda, film is popular, powerful and prevalent. As both consumers and producers of film, it is imperative that we learn about the digital techniques and strategies involved in how it can be used to tell stories and to persuade. The focus of the course is on film both as art and narrative and a medium of representation and persuasion, paying particular attention to aspects of film form, aesthetics and style. In this course, we will learn about the four elements of film: mise en scène, cinematography, editing and sound. We will then examine how equipping ourselves with critical visual media literacy will help us be more aware of how we make meaning from film.

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## IEL0025 Fundamentals of Phonics for Early Childhood

*Duration: 9 hours (including e-learning)*

In this course we will learn the concepts of and differences between phonological awareness and phonemic awareness, how these pre-reading listening skills relate to phonics instruction in reading. We will also learn about the importance of systematic and explicit phonics teaching in early childhood.

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## IEL0026 Reading for Life: Developing Wide and Deep Reading Habits

*Duration: 12 hours (including e-learning)*

Reading for pleasure and to learn are vital for self-development and lifelong learning. This course will introduce participants to different texts and different approaches to engage with learning as a lifelong habit. As part of the course, participants will explore deep reading through the sustained reading of a self-selected text and participation in a book club discussion.

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## IEL0027 Babies Born to Talk: An Introduction to Language Acquisition

*Duration: 12 hours (including e-learning)*

This course examines the developmental milestones for speech and language development. Participants will learn about the stages children typically go through in learning the building blocks of language, the errors they make, and the ways in which adults can support the acquisition process. Participants will also gain an understanding of how the outcomes of language learning are not necessarily linked to children's cognitive ability but in fact, they are a result of linguistic and social factors in the child's environment. There will be a discussion on bilingualism.

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## IEL0028 *How difficult can grammar be?* A Practical Introduction to English Grammar

*Duration: 12 hours*

This course is intended as an accessible and practical introduction to the grammar of English, and aims to equip participants with an understanding of how English grammar works. Participants will gain insights into how language, and grammar rules specifically may vary depending on context; that is, variations in what we do depend on who we are communicating with, whether we are speaking face to face or communicating through writing. Participants will also be exposed to a variety of commonly occurring errors made by speakers in Singapore.

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## IEL0029 Effective communication for professional success

*Duration: 14 hours*

This course hones participants' communication skills for a variety of purposes and audiences in professional contexts, enabling them to deliver impactful presentations and contribute meaningfully in discussions. Hands-on tasks within job-related scenarios provide opportunities for participants to put into action the knowledge acquired to improve the form and function of their utterances. These activities are coupled with reflective exercises to widen their repertoires of metacognitive and interactional strategies for enhanced competence.

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## IEL0030 Design your Video Resume

*Duration: 14 hours (including e-learning)*

An emerging trend in the digital communication environment today is the growing popularity of video resumes. Such digital artefacts provide potential employers a quick sense of the identity, values, and ideas of the prospective jobseeker. A compelling digital resume helps one to stand out from the crowd and demonstrates a strong level of digital fluency – valued by many employers today. In this course, participants are guided in designing their digital product from a multimodal communication (Bezemer & Kress, 2015) and semiotic technologies (van Leeuwen, Djonov & O'Halloran, 2013; Lim 2021) perspective. A design thinking approach (Stanford d.school) is adopted to scaffold the creation and performance of a digital presentation of the self. The goal is for participants to produce dazzling short introductory videos of themselves that can be used to accompany their digital resumes.

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## IEL0031 Engaging Young Children in Reading

*Duration: 7.5 hours (including e-learning)*

In this course we will learn to choose books that children will enjoy because of their rich narrative, the language and its rhythms, and the powerful visuals. We will look at different types of books that are found in the wide spectrum of children's literature, and find out why some are more popular than others, and what makes for an award-winning book. We will learn to engage the children in understanding their reading through interesting questioning and conversation, with the emphasis on pleasure, motivation, and conversation. This is to ensure that children are likely to develop the habit of reading in the future. Furthermore, an interactive exposure to storybooks is considered as an effective stimulant for the development of two pillars of learning to read: oral language and print knowledge.

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## IEL1045 Grammar for Assessment (Primary)

*Duration: 24 hours*

This course aims to introduce participants to core prescriptive grammatical knowledge required in assessment papers. The course will be conducted through eight sessions (3 hours each). Participants will also be introduced to different grammar references, including Michael Swan's Practical English Usage, which is given to all schools and which they can utilise in the classroom.
By the end of the course, participants should be able to explain grammar questions/answers commonly found in assessment papers, using the knowledge gained in the course.

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## IEL1067 E-pedagogies for English: Making learning engaging, exciting, and enduring

*Duration: 12 hours (including e-learning)*

Through the analysis and discussion of authentic case studies, you will learn various theories, practical strategies (e.g. game-based learning, digital storytelling), and develop the skills and capacities to design innovative lessons that incorporate technology in engaging, exciting, and enduring ways to teach and learn the English Language (EL) at the primary level.

At the end of the course, you would have some practical lesson ideas and material to use right away when you return to your class.

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## IEL2087 Teaching Julius Caesar

*Duration: 7 hours*

This course will introduce dramatic, kinaesthetic, student-centred and writing strategies for introducing and teaching William Shakespeare's play Julius Caesar both stimulatingly and effectively to 'O' Level Literature students. You will learn how to help and facilitate your students in independently unpacking Shakespeare's colourful and originally rich language in illuminating ways; initially in discussion and other preparatory activities, and ultimately in genuine, informed and personally unique written responses to the 'O' Level question.

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## IEL2089 Teaching John Wyndham's The Midwich Cuckoos

*Duration: 7 hours*

This course will introduce strategies for introducing and teaching a new addition to the 'O' Level syllabus: John Wyndham's vintage English science fiction novel The Midwich Cuckoos. These stimulating kinaesthetic student-centred, context and discussion-based activities will help students respond informedly, personally, perceptively and uniquely to Wyndham's novel; and help to focus students' answers when responding to 'O' Level examination questions on the text.

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## IEL2101 Understanding and Teaching Poetic Form for Secondary School Literature

*Duration: 6 hours*

This course will provide participants with useful pedagogical strategies to introduce and teach poetic form to students. It will seek to analyse form in two ways: i) as a structural object of analysis and ii) as an indicator of literary and cultural concerns. By locating the changes in form and formal analysis as effective registers of shifts in literary sensibilities and patterns of meaning, this course explores how poetry continually responds to contemporary matters of class, gender, society and language. Special emphasis will be given to the contemporary usage of distinct forms in Singaporean poetry, in order to understand how traditional forms are reworked and negotiated to fold poetic form out towards the multifaceted intersection between Singaporean history, society and cultural discourse. Participants will have practice crafting lesson plans and packages using different poetic forms and concrete poetic examples ranging from diverse literary traditions.

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## IEL2102 Designing Blended Secondary English Language Lessons

*Duration: 7 hours*

In this course, participants will learn key principles of e-pedagogies and different blended learning models which they can use to guide them in designing a lesson to teach the English Language. They will also be exposed to an array of digital tools that can value-add to the teaching and learning of different language learning skills which they can incorporate in their Blended Learning English Language classroom.

## IER0020 Using Data for School Improvement

*Duration: 12 hours (including e-learning)*

This course will provide some understanding and appreciation of data and how this can be used for interpretation for better decision-making. It expands participants' repertoire of data skills. Participants will learn to appreciate the power of visualising statistics and how to craft more meaningful visualisations to communicate their messages more effectively. Participants will also be introduced to analytics tools to better interpret data.

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## IER0021 Introduction to Data Science and Machine Learning

*Duration: 7 hours*

With the amount of data that is being generated and the evolution in the field of Analytics, data science has turned out to be a necessity. Data science has increasingly become popular all over the world and has created a widespread impact across various sectors. Data science can be defined as a blend of mathematics, business acumen, tools, algorithms and machine learning techniques, all of which help us in finding out the hidden insights or patterns from raw data which can be of major use in the formation of decisions. This workshop is designed to provide the participant with fundamental knowledge of data science and machine learning as well as hands-on practice to perform data visualization and analysis using some machine learning libraries with a common data science tool.

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## IER0022 Promoting Healthy Ageing through the Lens of Self-Determination Theory

*Duration: 3 hours*

This course will present recent empirical evidence and insights into healthy ageing through the application of self-determination theory (SDT). It is also important to note that the motivation factors underpinning healthy ageing are often neglected This course features the application of SDT on making sense of the healthy ageing process and in crafting a set of guidelines that support this process, which poses a challenge for most, if not all, individuals. This course will focus on how SDT drives healthy, successful and active ageing. This course is particularly timely given the expanding ageing crisis in many countries, including Asian contexts and our society. Some guidelines and hands-on activities will be provided to empower participants towards greater agency in managing their functioning and their ageing process for a productive, fulfilling and meaningful life.

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## IER0023 O-level Computing Teachers' Content Upgrading Course

*Duration: 160 hours (including e-learning)*

The Computing Teachers' Content Upgrading Course is a collaboration between MOE CPDD and NIE to provide a comprehensive, rigorous, and pedagogy-infused professional developmental programme for non-Computing in-service teachers to be equipped with the theoretical knowledge and practical skills to teach O-level Computing effectively. It aligns with Singapore's smart nation vision and national AI strategy to layer the teaching of computer science across all learners' journeys, with the aim of developing 'bilingual individuals' who can apply computer science and AI concepts in their respective domains. Upon successful course completion, educators will also be better prepared to initiate STEM/STEAM-related programmes in their schools and support their students' learning in infocomm exploration and activities.

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## IER0024 A-level Computing Teachers' Content Upgrading Course

*Duration: 240 hours (including e-learning)*

The Computing Teachers' Content Upgrading Course is a collaboration between MOE CPDD and NIE to provide a comprehensive, rigorous, and pedagogy-infused professional developmental programme for non-Computing in-service teachers to be equipped with the theoretical knowledge and practical skills to teach A-level Computing effectively. It aligns with Singapore's smart nation vision and national AI strategy to layer the teaching of computer science across all learners' journeys, with the aim of developing 'bilingual individuals' who can apply computer science and AI concepts in their respective domains. Upon successful course completion, educators will also be better prepared to initiate STEM/STEAM-related programmes in their schools and support their students' learning in infocomm exploration and activities.

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## IER0025 Student-Centred Balanced Assessment

*Duration: 4 hours (including e-learning)*

This Student-Centred Balanced Assessment workshop hopes to provide teachers with a better understanding about student self-assessment and its potential benefits to teachers and students. This workshop will introduce a variety of self-assessment strategies, look at how to design and craft assessment tasks and criteria for self-assessment as well as present the conditions for effective feedback and how to engage students through feedback. There will also be a hands-on component for teachers to work together to co-design self-assessment (task and criteria) for their students' use.

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## IHS2281 Workshop on Curriculum-making for Secondary Geography Syllabuses

*Duration: 8 hours*

This course helps participants understand their role as curriculum makers in the Geography classroom with respect to the Geography syllabuses. Participants will unpack the skills, techniques and topical concepts in the syllabuses, and identify ways to facilitate their purposeful and meaningful teaching of geography. This course will enable participants to engage with the subject matter, make decisions to align the curriculum to their students' needs, and plan an inquiry sequence to enact the curriculum in their classrooms.

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## IHS2291 Application of Topographical Maps for Inquiry for Secondary Geography

*Duration: 3 hours*

This workshop re-visits the fundamentals of reading and interpreting topographical maps. Aligned to the recommended pedagogy of inquiry in the Geography syllabuses, participants will explore how topographical maps can be used for inquiry-based teaching and learning. Together with fellow participants, lesson ideas will be developed to facilitate inquiry with the use of topographical maps

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## IHS2271 Dynamics of Governance in Colonial Singapore (1819- 1942) - Impetus and Im-

*Duration: 3 hours (including e-learning)*

This content seminar will look at how the British governed Singapore. With consideration of the political structures extant during colonial times, it will touch upon the impetus of certain key decisions made by the British, shaped by global, regional and local factors, and how these moves impacted the socio-political landscape of the port-city.

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## IHS2282 Outbreak of War in Asia Pacific

*Duration: 3 hours (including e-learning)*

This seminar focuses on the key historical developments in Japan that evolved and contributed to the outbreak of war in the Asia Pacific in 1941. The discussion will begin with the 1860s when Japan, under threat of Western imperialism, embarked on a search for modernity beginning with the Meiji Restoration which saw the implementation of a series of political, economic and social reforms aimed at strengthening the country. It will end in the late 1930s to early 1940s as Japan, confident in the success of her modernization, became increasingly competitive in her search for political space and economic resources and resorted eventually to aggression as a means of achieving her aims.

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## IHS2283 Seminar on Cold War in Asia: The Vietnam War

*Duration: 3 hours (including e-learning)*

The course highlights the agency of local political actors while also clarifying their global interconnections.

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## IHS2284 Defending Singapore (1930s-1942) - Did Singapore have to fall?

*Duration: 3 hours (including e-learning)*

Winston Churchill famously said that the Fall of Singapore was Britain's greatest military catastrophe. How did the 'impregnable fortress' fall so quickly? This content seminar will deal with British military strategies and the preparations Britain took to defend the island. These, viewed alongside Japanese capabilities and tactics, shed light on why the 'fortress' eventually capitulated and raise questions over whether Singapore had to fall.

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## IHS2285 Vice and Virtue in Colonial Singapore (1819–1942)

*Duration: 3 hours*

This course explores colonial life in Singapore and the social developments that took place throughout British colonial rule. As a rapidly growing and increasingly cosmopolitan port-city, Colonial Singapore, with inhabitants hailing from different corners of the world, could not be insulated from global and regional developments. These developments, in turn, influenced social and intellectual developments within the port-city itself. The growth of the settlement also brought with it different challenges, in particular social ills.

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## IHS2286 From Temasek to Singapore: Orienting students to the study of history and pre-1819 history of Singapore

*Duration: 3 hours (including e-learning)*

The course provides history teachers with supplementary and overarching ideas to introduce the study of history for newly enrolled Secondary One students. It introduces and grounds participants in historical inquiry and historical concepts, and weaves these into the discussion and investigation of pre-1819 history of Singapore. Teachers will also have the opportunity to work on selected historical sources and use them for classroom instruction.

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## IHS2287 Using war and historical films to teach secondary school history

*Duration: 3 hours (including e-learning)*

War and historical films are a niche and attractive genre to explore not only for military buffs. The perspective taken of a war movie can be written, beyond the battlefield, from the angles of politics, business as well as culture and ideology; history can naturally encompass all of these angles. This course hopes to approach the analysis of the movies from the perspective of film review-writing. Teachers teaching secondary school history can draw upon this approach to help their students analyse historical films. The use of these films can complement the study of history in the classroom as well as be used for students' Historical Investigation projects. interconnections.

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## IHS2293 A-Level History Curriculum Design Workshop – Forming Nation-States (Part 1)

*Duration: 3 hours*

With so many individual countries, each with its own history of forging a nation-state, how can we conceptualize postwar Southeast Asian history in way that will engage students without leaving them confused? This course helps participants with this challenge by introducing broad strategies for balancing the need for knowledge of the region's national histories with teaching regional themes.

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## IHS2294 Militarist Japan

*Duration: 3 hours (including e-learning)*

As a thoroughly modernized state that viewed imperialism as a demonstration of its power, Japan sought to assert herself as a great power through territorial conquests first in East Asia and then in the wider Asia-Pacific region. This seminar will explore in greater detail the context and the reasons that enabled the rise of militarism in Japan in the 1930s, as well as how the increased influence of the militarists led to unfortunate consequences for Japan eventually.

## IHS2292 E4 Cluster Differentiating Instruction in the Humanities

*Duration: 6 hours (including e-learning)*

Differentiated Instruction (DI) promises to cater to the learning needs of diverse students but is often difficult to implement effectively. This course revisits the basic principles behind DI to emphasize planned decision-making for instruction for the Humanities. It will also explore the impact of DI in the Singapore classroom by exploring local research studies. The course will follow up with conversations on how to tier instruction in the Humanities classroom by getting participants to design, implement and share their lesson designs.

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## IHS2295 Thinking about Source-based Case Study skills through Structure of Process

*Duration: 3 hours*

Erickson, Lanning and French  proposed the use of concept-based curriculum and instruction to design learning experiences that will promote understanding and transference. Using the framework developed by Lynn Erickson, Lois Lanning and Rachel French, the course seeks to engage participants in re-examining their thinking about SBCS skills and how they can use this new understanding to engage students in the learning of these skills.

In this course, participants will analyse and unpack selected SBCS skills using the Structure of Process. Through this framework, they will get an opportunity to challenge each other's perspective of the skills in a logical and constructive manner.

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# LEARNING SCIENCES

## ILA0020 Introduction to Computational Thinking

*Duration: 22 hours (including e-learning)*

This course provides an introduction to Computational Thinking (CT), the skills and competencies in CT, and CT education.It is suitable for those who want to incorporate CT into their teaching, especiallty for Math and Science teachers.The course will teach some introductory visual block programming as a basis for launching into discussions of CT integration into the curriculum.

You will be accessed for this course.

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## ILA0021 Introduction to AI & Education

*Duration: 12 hours (including e-learning)*

This course provides an introduction to the application of AI to education. Course attendees will develop a basic understanding of AI technologies and its application to enhancing learning environments, such as intelligent tutoring systems and learning analytics. The course is suitable for Heads of Departments, teachers and HQ officers who want to develop some basic knowledge of or need to be savvy about the potential of AI to teaching and learning.

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## ILA0028 Beginners' Guide to Academic Reading and Writing

*Duration: 8 hours (including e-learning)*

This course will give tips needed to understand academic articles (e.g., from journals). It will also help participants transfer this understanding to their own academic writing for assignments.

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## ILA0033 A Typology of Practices to Boost Student Engagement and Uptake of Feedback

*Duration: 7 hours*

This blended course will present a typology of feedback practices used in schools. Discussion and hands-on practice using actual student artifacts will centre on how different feedback practices can help or hinder learner engagement. affectively, behaviourally and cognitively.

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## ILA0035 e-Pedagogy for the Primary Classroom

*Duration: 3 hours*

This course focuses on e-Pedagogy for designing and facilitating digital learning experiences in a primary school setting. Participants will learn how to apply concepts and principles of e-pedagogy to design and facilitate the learning using the SLS Pedagogical Scaffolds 2.0 and SLS Lesson design map. Subject-specific resources and tools will be shared with the participants to aid their design of meaningful digital learning experiences for their students.

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## ILA0036 e-Pedagogy for the Primary/Sec/Pre-U Classroom

*Duration: 4 hours*

This course focuses on e-Pedagogy for designing and facilitating digital learning experiences in a primary, secondary and pre-university setting. Participants will learn how to apply concepts and principles of e-pedagogy to design and facilitate the meaningful learning experiences using technology. Subject-specific resources and tools will be shared with the participants to aid their design of meaningful digital learning experiences for their students.

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## ILA0045 Planning and Designing Meaningful ICT-enhanced Collaborative Learning Experiences in A-Level Project Work (PW)

*Duration: 3 hours*

In this course, participants will deepen their understanding of collaborative learning and how various collaborative learning strategies can be used to motivate, engage and support student learning in PW. They will share and reflect on their current approaches to collaborative learning in their instructional programme and consider how the learning experience can be enhanced. They will also explore different ICT tools that can support collaborative learning in PW.

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## ILA0046 Facilitating Meaningful ICT-enhanced Collaborative Learning experiences in A-Level Project Work (PW)

*Duration: 3 hours*

In this course, participants will deepen their understanding of collaborative learning and how various collaborative learning strategies can be used to motivate, engage and support student learning in PW. They will share, reflect, and build on their current teaching practices. They will also explore different ICT tools that can support collaborative learning in PW.

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## ILS0001 Classroom Management

*Duration: 8 hours*

Using small group discussions, facilitated by school practitioners, and a case study approach; this full-day course serves to equip primary/secondary/junior college teachers with the principles of classroom management and knowledge of a range of strategies to manage their classrooms to bring about effective learning. Teachers will also gain awareness on how positive Teacher-Student Relationship (TSR) can help them with classroom management. Teachers' classroom cases are also used for collaborative problem-solving, discussion and presentations.

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## ILS0008 Technological Pedagogical Content Knowledge for ICT Lesson Design

*Duration: 8 hours*

Integrating ICT into teaching and learning is a complex endeavour that requires careful consideration of technology and pedagogy. Recently, the emergence of the technological pedagogical content knowledge (TPACK) framework has unpacked the types of knowledge that teachers/ instructors needed in order to enhance learning with ICT. This course equips teachers with the basic knowledge of the TPACK framework. It engages the teachers to review their lessons and ICT-based learning resources and facilitate the design of ICT lessons through the TPACK framework. At the end of the course, it is hoped that the participants are more able to draw from various sources of knowledge to create ICT integrated lesson at a higher level.

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## ILS0013 Introduction to Instructional Design

*Duration: 7 hours*

Instructional design is the systematic process undertaken to analyse instructional problems and to design training programmes. This course will provide the participants with an introduction of major instructional design models and the important considerations for developing learning objectives, selecting content, planning instructional strategies, designing instructional materials, as well as the implementation of training programmes.

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## ILS0014 Introduction to Programme Evaluation

*Duration: 7 hours*

There is a pressing need for teaching professional to evaluate an education programme (curriculum, course, lesson or a particular intervention) with empirical evidence so as to determine the strength and area for improvement for the programme. This course will cover the rationale of conducting programme evaluation, evaluation approaches and models, the procedures for planning, conducting and using evaluations in educational setting, instrument design for evaluation, the data collection and analysis for evaluation.

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## ILS0015 Designing Lesson with 3D Printing Technology

*Duration: 8 hours*

With the advancement and affordability of 3D printing technology, classroom teachers can now use this technology and apply it to classroom teaching. 3D printing changes students' role and disposition from one that is teacher directed towards becoming self-directed and independent learners. Teachers can leverage the affordances of 3D printing into designing a lesson that engages students in exploring, designing and share new and innovative ideas.

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## ILS0016 Designing 21st Century Quality Learning (21QL) Using LEGO EV3

*Duration: 8 hours*

Using robotic technology in classroom teaching, allows and encourages students to be creative and innovative. It also allows them to learn actively in different authentic scenarios. The collaborative learning processes demand that students constantly monitor their actions and decisions. Their reflection on their decisions will help them reach quality solutions. Teachers can leverage the affordances of LEGO EV3 into designing 21QL lessons that engage students to think innovatively and create valuable knowledge to address authentic problems and challenges of today's world.

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## ILS0017 Using and Creating Video for Student Learning

*Duration: 8 hours*

In this new information age, many schools and institutions extensively utilise videos in training and education courses. Videos are also key to the success of blended learning and flip teaching. This short course illustrates the strengths and limitations of both audio and video media. The different genres of video will also be discussed. This course discusses how and when to use video and includes practice on how to create a video for flipped teaching using mobile phones, PowerPoint Mix and IPADS.

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## ILS0018 Play, with ICT!

*Duration: 3 hours*

What is your vision of a future classroom? What is your vision of an ideal classroom? If you think it should be fun, engaging, and where meaningful learning takes place, join us in exploring the utilisation of ICT platforms to break the monotony of classroom teaching and learning. Gain insights on the affordances of various tools and share your perspectives on how teachers can better facilitate students' learning. Have fun trying, experiencing, and creating ICT resources; and translate these practices into your classroom.

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## ILS0019 Flip Your Lessons for Meaningful and Differentiated Learning

*Duration: 8 hours*

Flipped learning pedagogy is gaining traction with teachers and students across the globe because of its potential to redefine the whole enterprise of teaching and learning thanks to the new possibilities afforded by rapidly evolving technologies. Proponents of flipped learning cite increased learner engagement, more timely feedback, and deeper and more meaningful learning due to better use of curriculum time. If you have heard your colleagues talk about flipping their lessons and wondered what it is and how to go about flipping your own lessons, this is the right workshop for you.

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## ILS0020 Designing Student Online Collaboration Supported by Social Media Tools

*Duration: 8 hours*

With the ever-growing availability of social media tools, classroom teachers can leverage on tools such as messages, voice, images and shared resources to engage students in exploring new ways to communicate with peers in purposeful online collaborative projects. To facilitate students' learning in collaborating effectively in small groups and across different cultural settings, the choice of social media tools, the instructional strategies and the quality of collaborative learning require thoughtful designing and implementing.

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## ILS0021 Exploring the Use of Technology in Classroom Assessments

*Duration: 8 hours*

The availability of online tools offers opportunities for educators to tap into the potential of technology in classroom assessments. If you have not used any common online tools for assessments before but would like to explore how to do so, this course is for you. This course will introduce participants to common online tools that can be incorporated into classroom teaching and learning. In this introductory course, participants will explore the basic features of online tools and deliberate on the potential and challenges of using such tools in classroom assessments.

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## ILS1002 Supporting Self-Directed and Collaborative Learning with ICT

*Duration: 8 hours*

Participants will be introduced to the key concepts of self-directed and collaborative learning. These concepts will be explored through worked examples. Participants can expect to work in groups to design tasks that incorporate self-directed and collaborative learning for teaching and learning. Discussions on issues relating to lesson design, facilitation and use of ICT to support self-directed and collaborative will also be raised in the course.

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## IS0001 Tools to Enhance Self-Feedback Generation

*Duration: 3 hours*

Teachers across educational systems struggle to find time to provide quality feedback to their students. Asking students to create their own feedback has been shown to enhance students' performance. We will review results of studies that revealed effective use of rubrics and exemplars as tools that may foster self-feedback generation. Contexts and conditions will also be discussed.

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## IS0002 Student-Feedback Interaction Framework

*Duration: 3 hours*

In this course I will describe a series of studies that examined instructional feedback, its mechanisms, and its complex and variable effects on a range of meaningful educational outcomes. I will present a model that explicates the process underlying the efficacy of instructional feedback and will discuss conditions under which feedback would be most conducive to improved performance. Grades, praise, and other common feedback practices will be described. Further, I will offer approaches to providing students with standardized feedback. I will discuss studies conducted in different contexts and academic domains, as well as some specifics of student receptivity of feedback and instructor judgment when providing it.

# MALAY

## IA1001 Reading and Writing Strategies with MAS Novels: 'Making Connections in Reading Comprehension' and 'Enhancing Vocabulary in Composition Writing through Synonyms

*Duration: 8 hours*

In this one-day workshop, participants will learn two strategies: (1) 'Making Connections in Reading Comprehension' to teach reading skills; and (2) 'Enhancing Vocabulary in Composition Writing through Synonyms and Antonyms' to teach writing skills at the primary level. These research-based strategies aim to improve student's reading and writing competencies. MAS novels will be the textual reference for both strategies.

# MATHEMATICS

## IME1025 Designing Learning Activities that Integrate Learning Experiences in Primary 1 and Primary 2 Mathematics

*Duration: 12 hours*

This course focuses on ways to integrate learning experiences to engage lower primary pupils in learning mathematics. Participants will examine the use of various resources and instructional strategies that promote sense-making and reasoning among young children.

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## IME1028 Error Analysis and Remediation

*Duration: 12 hours*

Not all mistakes are careless mistakes. The mistakes made by children may be symptomatic of some underlying misconceptions. Such errors are defined as systematic errors. Unless teachers understand why children make such mistakes, re-teaching the concept would not be helpful to these children. In this course, examples of systematic errors involving counting, whole numbers and the four operations are analysed to understand why children make such errors.

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## IME1032 School-based Mathematics Curriculum Development

*Duration: 24 hours*

This course provides experienced primary mathematics teachers with the knowledge and skills needed to plan, implement and evaluate mathematics curriculum innovations at the school level.

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## IME1035 The Use of Games in the Teaching and Learning of Primary Mathematics

*Duration: 12 hours*

Working memory has been found to be an important factor in helping children learn mathematics. There are a number of games specially designed around specific mathematics concepts to help children improve their working memory and at the same time enhance their mathematical reasoning skills, their visual and spatial orientation. In this course, teachers would be introduced to a range of such games.

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## IME1036 Designing Learning Activities that Integrate Learning Experiences in Primary 3 and Primary 4 Mathematics

*Duration: 12 hours*

Learning involves pupils actively engaged in the construction of knowledge, that is, to be hands-on and minds on. This workshop shows teachers how to design teaching and learning activities that incorporate Learning Experiences (LE) that will engage pupils in the mathematics classroom and support the implementation of the new mathematics curriculum.

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## IME1037 Formative Assessment in Primary Mathematics: Effective Implementation and Practice

*Duration: 12 hours*

The focus of this course is on how to develop formative assessment tasks as part of teaching and learning in primary mathematics classrooms.

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## IME1040 Promoting Metacognition in Primary School Children

*Duration: 12 hours*

The focus of this course is to equip teachers with approaches to address metacognition in the primary mathematics classroom.

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## IME1041 Strategies to Teach Primary 1 to Primary 3 Low Progress Pupils to Solve Mathematical Process Problems

*Duration: 12 hours*

Process problems require pupils to develop general strategies for understanding, planning, solving problems as well as evaluating possible solutions. Process problems can be presented as word problems. This course will provide Primary 1 to Primary 3 mathematics teachers with the necessary knowledge and skills for teaching problem-solving in the mathematics classroom. Teachers will identify the factors that contribute to low-progress learners' difficulties in mathematical problem solving. Teachers will also be led through the various strategies to help low-progress pupils solve process problems. As part of the course, teachers will also adapt and design process problems/tasks to meet varied learning needs and interests as well as evaluate the effectiveness of these. Problem-solving frameworks and checklists to help low-progress pupils solve mathematical problems will also be shared and discussed.

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## IME1042 Challenging Mathematically Able Lower Primary Pupils

*Duration: 12 hours*

Like the pupils in the Learning Support Mathematics (LSM) programme, mathematically able pupils in the standard classroom are also at risk of underperforming in school. These pupils need to be exposed to an adequately challenging learning environment. The course explores some strategies and learning activities that teachers can adopt to cater to the needs of these pupils.

## IME1043 Using Children's Literature to Promote Learning of Lower Primary Mathematics

*Duration: 12 hours*

Children like reading stories. One way to engage children in learning mathematics is to integrate children's literature into their mathematics lessons. This course examines how children's literature can be used as a vehicle for designing activities to help children learn mathematics and develop their process skills in mathematics.

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## IME1044 Designing Learning Activities that Integrate Learning Experiences in Primary 5 & Primary 6 Mathematics

*Duration: 12 hours*

This course will focus on using a range of activities that are meaningful and engaging for teaching mathematics in the primary 5 and 6 classroom. Participants in this course will engage in a variety of hands-on activites that can be used as learning experiences in their mathematics classrooms Links will be made with the Singapore mathematics curriculum for participants to think more critically how those activities achieve curriculum objectives.

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## IME1045 Teaching and Learning of Measurement at Lower Primary: Teaching Towards Big Idea About Measure

*Duration: 24 hours*

The course aims to increase teachers' pedagogical content knowledge for the teaching of Measurement at the lower primary levels. Principles of measurement and measurement concepts at the lower primary levels involving length, mass, area, and volume are covered. The discussion will also be viewed from the perspective of teaching towards the big idea measure. Related activities and teaching strategies will be also be examined.

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## IME1047 Fractions: Promoting Connections and Deep Learning

*Duration: 12 hours*

This course will focus on different strategies to promote connections and deep learning for fractions in the primary mathematics classrooms. Participants in this course will be actively engaged in the selection, design and critical reflection of mathematical tasks that cultivate mathematical reasoning and thinking for fractions.

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## IME1048 Making Thinking Visible in Primary Mathematics

*Duration: 3 hours*

This course will focus on different strategies to promote mathematical thinking and reasoning in the primary mathematics classrooms.

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## IME1050 Holistic Assessment Performance Tasks: For Primary 1 & 2 Teachers (Mathematics)

*Duration: 3 hours*

This course discusses different performance tasks for Primary 1 and 2 pupils and the evaluation of mathematical thinking and reasoning from these tasks. Participants will work on some tasks and engage in discussion about task design.

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## IME1051 Holistic Approach for Developing Mathematical Understanding

*Duration: 12 hours*

The course aims to equip educators with a holistic approach for developing mathematical understanding. The course will draw on the S(skills), P(properties), U(uses) and R(representations) framework and engage participants in crafting mathematical tasks for nurturing primary school pupils' understanding of mathematics.

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## IME1052 Strategies To Engage Primary School Pupils In Reasoning and Communication

*Duration: 12 hours*

SPUR (S-skills, P-properties, U-uses, R-representations) is a multi-dimensional framework for assessing understanding of mathematics. The course will ensure that students have a robust understanding of how mathematics assessment tasks should assess Skills, Properties, Uses and Representations of the knowledge they acquire. This course will introduce participants to the framework and provide them with the knowledge and skills to use in their classroom instruction.

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## IME1054 Designing Tasks to Foster Mathematical Reasoning

*Duration: 3 hours*

This course will focus on task design principles to design meaningful and engaging tasks for primary mathematics classrooms. In particular, the selection, design and implementation of examples and tasks to foster mathematical reasoning in the primary mathematics classrooms will be discussed. Links will also be made with the Singapore Mathematics curriculum for participants to think more critically on how those tasks achieve curriculum objectives.

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## IME1055 Differentiated Instruction for Primary Mathematics (1) – Number and Algebra Strand

*Duration: 6 hours*

This course will cover key aspects of differentiated instruction in terms of the rationale, curriculum and pedagogical approaches. The course will cover mathematical content from the numbers and algebra strand. Mathematical processes such as reasoning and communication will also be incorporated.

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## IME1061 Inquiry-Based Learning for Primary Mathematics (1) – Number and Algebra Strand

*Duration: 6 hours*

This course will cover key aspects of inquiry-based learning in terms of the rationale and inquiry processes that contribute to habits of mind for inquiry, curriculum and pedagogical approaches. The course will focus on mathematical content from the numbers and algebra strand.

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## IME1062 Teaching Children To Recognise Patterns Through Inquiry-based Learning

*Duration: 9 hours*

Pattern generalising tasks are a common feature under problem solving at the primary school level. However, detecting pattern structure is often very elusive for many young children, with many of them failing to navigate this process successfully. This course introduces participants to the different types of pattern generalising tasks in the primary mathematics curriculum, and the various strategies to recognise the pattern structure through inquiry.

By the end of the course, participants should be able to explain grammar questions/answers commonly found in assessment papers, using the knowledge gained in the course.

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## IME1063 Big Ideas: What is Equivalence? (Primary Mathematics)

*Duration: 6 hours*

Big Ideas express ideas that are central to mathematics. They bring coherence and connect ideas from different strands and levels. There are many instances of equivalence in the learning of mathematics. Equivalence is a relationship that expresses the 'equality' of two mathematical objects that may be represented in two different forms. Participants will learn and create opportunities for children to learn about the big ideas of equivalence. Participants will plan and infuse big ideas in the classroom, including how to design mathematical activities that are rich enough to bring out the essence of these big ideas of equivalence.

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## IME1064 Mathematical Problem Solving for Upper Primary Students

*Duration: 9 hours*

Mathematical problem solving is the central focus of the mathematics framework for the Singapore Mathematics Curriculum. In this course, participants will learn about the use of the heuristics and thinking skills recommended in the Singapore Primary Mathematics Curriculum in solving challenging problems. The teaching of problem solving heuristics and thinking skills at upper primary levels will also be discussed.

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## IME1067 Big Ideas: The Mathematics Behind Proportionality

*Duration: 9 hours*

This course will help mathematics teachers to understand what the big idea of proportionality is, what the different types of proportionality and their respective key features are, and how proportionality is manifested in the primary mathematics curriculum. In this course, teachers will also find out how proportionality is manifested in the secondary mathematics curriculum, and thus see why it is such an important and big idea in mathematics. The course will then get teachers to take note of how proportionality is described and introduced at the primary and secondary levels. Opportunities will be provided for teachers to discuss and share how they would plan and enact a lesson to teach towards the big idea of proportionality.

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## IME1068 What's the Fuss about Big Ideas in Mathematics?

*Duration: 12 hours*

This course attempts to provide mathematics teachers with the why, what, and how of teaching towards big ideas. In particular, it will rationalise the teaching towards big ideas from the perspective of the learners and examine such an approach from a learning-theories point of view. This course will also examine the perspective of big ideas from a disciplinary point of view, i.e., what we hope to achieve in the learning of mathematics when we teach towards big ideas. It will equip participants with knowledge of the appropriate and relevant steps to be taken in lesson preparation and enactment to teach towards big ideas.

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## IME1070 Use of Formative Assessment to Support Differentiated Instruction in Primary Math

*Duration: 9 hours*

This course will provide experienced primary Mathematics teachers with a theoretical foundation of formative assessment and the role it plays to support differentiated instruction. Building on a basic understanding of the guiding principles of differentiated instruction, the course will guide participants on how to adapt and integrate various assessment modes for diagnosis and subsequent instructional or remediation strategies to provide just-in-time feedback in response to the diverse needs of students (i.e., assessment for learning) in Mathematics. There will be opportunities for participants to reflect on and revisit beliefs, assumptions and values underlying practices of differentiated instruction.

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## IME1071 Constructivist Approach to Promote IBL in Primary Mathematics

*Duration: 9 hours*

This course seeks to provide experienced primary mathematics teachers with an understanding of the theory underpinning the constructivist approach towards promoting inquiry-based learning in Primary Mathematics. It will equip the participants with both the knowledge and skills to adapt, plan, and implement constructivist learning designs that emphasizes the inquiry process as well as needs of diverse learners in mathematics learning.

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## IME1072 Developing Spatial Visualization (Primary Mathematics)

*Duration: 3 hours*

This course will focus on the design and use of activities to engage students in spatial visualization, central to understanding and creating mathematics and solving mathematics problems. Participants will also reflect on their conceptions of spatial visualization and its role in the primary mathematics classrooms.

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## IME1073 Differentiated Instruction in a Mathematics Lesson

*Duration: 6 hours*

The course aims to equip educators with knowledge and practice of differentiated instruction in mathematics. The course will engage participants in deepening their understanding of how content, process, product and learning environment may result in differentiated instruction. Following which participants will design and enact a mathematics lesson that characterises differentiated instruction.

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## IME1074 Facilitating Mathematical Problem Solving in a Mathematics Lesson

*Duration: 12 hours*

This course provides an overview of how primary school pupils develop mathematical problem-solving skills and processes in the primary mathematics classroom. Participants will be equipped with the skills to use strategies for engaging pupils in mathematical problem-solving skills and processes.

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## IME1075 Conceptual understanding and Problem-Solving

*Duration: 7.5 hours*

Different mathematics tasks trigger specific mathematics concepts.  Superficially mathematics tasks could be resolved. However what are the deep mathematics concepts underpinning these mathematics tasks.  This course motivates participants to look at the superficial and deep mathematics underpinning these tasks.

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## IME1076 Self-Directed Learning (SDL) and Growth Mindset in Mathematics

*Duration: 5 hours*

SDL can be described as a process in which learners initiate, complete, and evaluate the learning process, with or without help from others. The skills required for successful SDL can be considered as part of the 21st century competencies. Besides skills, it is also important that learners adopt a growth mindset during the learning process so that they see failures or mistakes as opportunities for learning during SDL. In this course, we will examine some of the design principles of SDL and ideas related to growth mindset before we evaluate current lesson designs using these principles and ideas. We will then refine the designs and try the new lessons with the aim of promoting SDL and a growth mindset in mathematics classrooms.

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## IME1077 Infusion of Thinking Skills in the Primary Mathematics Classroom

*Duration: 4 hours*

Undeniably, mathematics educators and teachers would agree that lessons with thinking skills infused tend to emphasise more on pupils understanding the concepts behind the topics rather than rote learning. It indicates that the development of thinking skills and mathematics learning should not be taught separately. Instead, thinking skills should be consciously infused and reinforced in daily mathematics classroom teaching. This course will explain and show how thinking skills such as analysing parts and whole, comparing, sequencing as well as identifying patterns and relationship could be infused in the teaching and learning of primary mathematics lessons.

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## IME2036 Algebra in Secondary Additional Mathematics

*Duration: 12 hours*

This course offers participants an opportunity to deepen their mathematical content knowledge in Algebra in the Additional Mathematics Syllabus. Focusing on topics such as Indices and Logarithms, Quadratic Equations and Inequalities, Binomial Theorem, and Partial Fractions, the course is particularly suitable for (i) mathematics teachers doing content upgrading, especially those who were from PGDE (Lower Secondary) and targeting to acquire knowledge and latest development in Additional Mathematics Algebra, (b) in-service teachers new to teaching Additional Mathematics and wishing to acquire a better understanding of the algebra topics, and (c) in-service teachers who are teaching Additional Mathematics and hoping to see different approaches to deal with different Algebra content in the Additional Mathematics syllabus.

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## IME2038 Geometry in Secondary Elementary Mathematics

*Duration: 12 hours*

This is a content-upgrading course on Geometry in upper secondary mathematics.

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## IME2051 Activity-Based Lessons for Low Ability Pupils in the Lower Secondary Mathematics Classroom

*Duration: 12 hours*

This course provides an opportunity for the lower secondary mathematics teachers to understand the principles and rationale of using activity-based lessons in teaching and learning. This course will also assist lower secondary mathematics teachers to examine the techniques and processes of conducting activity-based lessons for their lowability pupils. Teachers will also learn how to use manipulatives to help low-ability pupils understands mathematics concepts. Participants will revisit Concrete-Pictorial-Abstract (or C-P-A) approach to design activity-based lessons, including those for concept development and consolidation. Course participants are expected to participate in critical discussions pertaining to the various activities and through the process develop a deeper appreciation and greater insights into how low-ability pupils learn.

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## IME2053 Strategies for Teaching Mathematical Generalisation

*Duration: 12 hours*

Generalising is an important skill with many applications in the learning of mathematics. Yet it is often undervalued by mathematics teachers. This course introduces participants to the various types of pattern tasks and the different strategies of expressing generality in the topic of Number Patterns in the mathematics syllabus.

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## IME2055 Metacognition in the Mathematics Classroom

*Duration: 15 hours*

The aim of this course is to extend teachers' knowledge and understanding of the development of fractions. This course also assists teachers in developing lessons on fractions using innovative approaches that promote thinking.

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## IME2066 Effective Questioning and Facilitation Techniques for Secondary/ Polytechnics/ ITE Mathematics Educators

*Duration: 12 hours*

This course is designed for secondary mathematics teachers who wish to enhance their repertoire on the effective use of questioning and facilitation practices in the teaching of mathematics. It will engage the participants in analysing their current questioning and facilitation practices and trialing "new" techniques based on the Singapore mathematics curriculum framework. They will share their experiences during face-to-face sessions.

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## IME2073 Enhancing Deeper Understanding of Calculus and Students' Difficulties

*Duration: 12 hours*

We will have interactive discussions of some main calculus concepts and the concerns we have in teaching calculus. Students' common errors found in some past Cambridge exam papers will be highlighted as well.

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## IME2076 What has Elementary Number Theory Got to Do with School Arithmetic?

*Duration: 9 hours*

Arithmetic is the very first topic covered in secondary one mathematics. Students learn about factors, primes, prime factorisation, highest common factor and lowest common multiple. One application of prime factorisation is finding square roots and cube roots of whole numbers. For example, to find the square root of 2025, we express 2025 as a product of primes 34 x 52, from which we obtain the answer 32 x 5. On the other hand, the square root of 200 is not a whole number because 200 = 23 x 52 and the power of 2, which is 3, is odd. In contrast, we cannot say that the square root of 324 = 27 x 12 is not a whole number because the power of 27 is odd. Of course, we argue that we cannot make this conclusion because 27 x 12 is not a prime factorisation of 324. So what is so special about prime numbers? Why do we have to write a whole number N in prime factorisation form to determine conclusively whether the square root of N is a whole number or not? In this course, we shall discuss the mathematical principle behind this, and also explain why the algorithm for finding HCF and LCM using prime factorisation works.
We shall also touch on the representation of real numbers in decimals. What is the difference between rational and irrational numbers written in decimals? How do we know whether a fraction m/n written in decimal is terminating or non-terminating (2/5 = 0.4 is terminating, 2/3 = 0.666… is non-terminating)? These questions can be answered using elementary number theory.
We will also discuss some real-life applications of number theory; for example, how is the official reference of NRIC No., or the ISBN of books, obtained? We shall share some interesting mathematical puzzles involving number theory. For example, can you get four gallons of water using five and three gallon jugs with no markings? (In the movie “Die Hard 3”, John McClain (played by Bruce Willis) and Zenus (played by Samuel L. Jackson) have to solve this puzzle posed by the villain Peter Krieg (played by Jeremy Irons) in order to defuse a bomb. Had the villain asked them to get four gallons using three and six gallons jugs, would they be able to solve it?)

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## IME2079 Using the SPUR Framework to Assess Secondary Pupil Understanding in Mathematics

*Duration: 12 hours*

SPUR (S-skills, P-properties, U-uses, R-representations) is a multi-dimensional framework for assessing understanding of mathematics. The course will ensure that students have a robust understanding of how mathematics assessment tasks should assess Skills, Properties, Uses and Representations of the knowledge they acquire. This course will introduce participants to the framework and provide them with the knowledge and skills to use in their classroom instruction.

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## IME2081 Teaching H2 Further Mathematics: Applications of Integration and Numerical Methods

*Duration: 12 hours*

This course focuses on content knowledge related to the teaching of applications of integration and numerical methods in H2 Further Mathematics.

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## IME2084 Teaching H2 Further Mathematics: Matrices and Linear Spaces

*Duration: 15 hours*

This course is a review of some topics in linear algebra that are relevant to the H2 Further Mathematics topics on matrices and linear spaces.

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## IME2089 Maths Problems in Real-World Context: Design and Implementation

*Duration: 12 hours*

The use of problems in real-world contexts for teaching and learning has very much been in recent focus in Singapore schools and in international comparative studies such as PISA. Problems in real-world contexts are interesting platforms to showcase students' mathematical reasoning and communication. There are two parts to this course. The first part will discuss the different types of problems in real-world contexts involving differing degrees of open-endedness for teaching and learning purposes. The second part will focus on how a teacher could design and use PRWC tasks for assessment purposes according to the Singapore secondary school Elementary Mathematics syllabus.

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## IME2090 Engaging the Minds and Hearts of Mathematics Learners

*Duration: 12 hours*

This course will prepare secondary school teachers to put into practice various strategies to engage students actively in their minds and hearts when learning mathematics. It will guide teachers to search for resources or to develop their own materials, such as guided-discovery worksheets (with or without the use of concrete manipulatives and / or ICT), catchy maths songs, amusing maths videos, witty comics, intriguing maths puzzles and games, fascinating magic tricks, inspiring stories of famous mathematicians, celebration of important maths days and years, and interesting real-life examples and applications.

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## IME2095 Teaching A-Level Mathematics Using Real World Contexts

*Duration: 12 hours*

The real-world data and modes of operations are often complex and inexact. Thus, the 21st Century students must have the relevant mathematical skills to handle such complexity and inexactness, which intrinsically are unlike what students usually encounter in ideal theoretical settings. The A-Level Mathematics syllabus recognizes this emergent need to handle real-life contexts and emphasizes on the need to apply mathematics to tackle problems in such contexts. Such an emphasis must be realized in the processes of teaching and learning, and eventually must be manifested in all modes of assessment.

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## IME2096 Design Capacity for Mathematics Replacement Units

*Duration: 12 hours*

This is NOT a course – at least, it does not fit into the conventional image of "attending a course". In these mixed-purpose sessions, we cut through 'the layers' by going straight to the challenges of actual mathematics instruction – we design materials that will help our students learn better. In the process, we will learn more about mathematics, our students, and design.

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## IME2097 Engaging Normal Technical Students in Mathematics

*Duration: 6 hours*

This course will assist secondary mathematics teachers to examine the techniques and processes of engaging their normal technical stream students. Teachers will also learn how to use manipulative to help normal technical stream students understand mathematics concepts. Participants will revisit Concrete-Pictorial-Abstract (or C-P-A) approach to design activity-based lessons, including those for concept development and consolidation. Course participants are expected to participate in critical discussions pertaining to the various activities and through the process to develop a deeper appreciation and greater insights into how normal technical students learn.

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## IME2099 Teaching Towards Big Ideas for Secondary Mathematics Teachers

*Duration: 6 hours*

Big ideas and Learning Experiences are included in our latest mathematics curriculum to enhance students' understanding and appreciation of mathematics. While Learning Experiences are conceptualized in terms of mathematical tasks, big ideas are intended to be infused rather than explicitly taught. In some ways, big ideas are meant to guide the teaching and learning of mathematics. One approach to do this is to think of mathematics as a discipline. In this interactive workshop, teachers will unpack notion of big ideas, explore ways to teach about big ideas at pedagogically opportune times, and design appropriate learning experiences to teach towards big ideas.

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## IME2101 Problems in Real-World Contexts: Assessment of Mathematical Outcomes

*Duration: 24 hours*

It is important to provide opportunities for secondary school students to apply the mathematical content and skills they learn in solving problems situated in real-world contexts so as to foster mathematical literacy in the 21st century. Problems in real-world contexts (PRWC) were introduced at the "O" level mathematics examinations in 2016. This course focuses on the design of PRWC for assessment using examples from topics in the EMath syllabus. Design principles, the degree of open-endedness in a PRWC task, how mathematical reasoning is assessed will be discussed along with preparation of mark schemes.

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## IME2102 Crafting and Facilitating Mathematical Problems in Real-World Contexts

*Duration: 6 hours*

This course will equip secondary school mathematics teachers in crafting and facilitating Problems in Real-World Contexts (PRWC) for O-level and N(A)-level exams. The participants will be introduced to the Really MAD framework (Yeo, Choy, Ng & Ho, 2018) consisting of four design principles: Realistic Principle, Mathematical Principle, Activity Principle and Documentation Principle. In addition, they will be guided through some practical steps on how to incorporate the Really MAD framework in the design of the PRWC. Lastly, they will learn how to facilitate PRWC in the classroom and how to guide students to solve PRWC.

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## IME2103 Strategies to Engage Secondary School Students in Reasoning and Communication

*Duration: 12 hours*

The course aims to equip educators with simple but effective strategies they may use to engage students in reasoning and communication. The course will engage participants in designing mathematical tasks and creating learning environments that nurture students' articulation of their mathematical thinking and knowledge.

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## IME2104 The Art of Sequencing Mathematical Examples

*Duration: 6 hours*

The teachers' practice of presenting students with a list of mathematical examples to work on has a longstanding tradition and it is still common in classrooms all over the world. Is there an effective way to sequence these examples so that students are more likely to attain to the goals teachers intend? In this course, we answer this question not just based on theoretical grounds; we will also draw upon local research that maps how competent Singapore teachers design such example sequences.

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## IME2105 Creating mathematically powerful classrooms

*Duration: 12 hours*

The course aims to equip educators with a five-dimensional framework that facilitates the creation of activities that nurture mathematically powerful classrooms. The course will engage participants in examining the content and cognitive demand of mathematical tasks, and classroom discourse of their lessons. Following which participants will create/design activities that facilitate learning in mathematically powerful classrooms.

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## IME2109 Use of Formative Assessment to Support Differentiated Instruction in Secondary Mathematics

*Duration: 9 hours*

This course will provide experienced secondary mathematics teachers with a theoretical foundation of formative assessment and the role it plays to support differentiated instruction. Building on a basic understanding of the general principles of differentiated instruction, the course will guide participants on how to adapt and integrate various assessment modes for diagnosis and subsequent instructional or remediation strategies to provide just-in-time feedback in response to the diverse needs of students (i.e. assessment for learning) in Mathematics. There will be opportunities for participants to reflects on and revisit beliefs, assumptions and values underlying practices of differentiated instruction.

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## IME2110 Constructivist Approach to Promote IBL in Secondary Mathematics

*Duration: 9 hours*

This course seeks to provide experienced secondary mathematics teachers with an understanding of the theory underpinning the constructivist approach towards promoting inquiry-based learning in secondary mathematics. It will equip the participants with both the knowledge and skills to adapt, plan, and implement constructivist learning designs that emphasizes the inquiry process as well as needs of diverse learners in mathematics learning.

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## IME2111 Constructivist Approach to Promote IBL in A-Level Mathematics

*Duration: 9 hours*

This course seeks to provide experienced A-Level mathematics teachers with an understanding of the theory underpinning the constructivist approach towards promoting inquiry-based learning in A-Level mathematics. It will equip the participants with both the knowledge and skills to adapt, plan, and implement constructivist learning designs that emphasizes the inquiry process as well as needs of diverse learners in mathematics learning.

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## IME2112 Basic Coding for Secondary Mathematics Teachers

*Duration: 12 hours (including e-learning)*

A basic course in coding for teachers will include fundamental programming concepts like data structures/types, flow chart, basic syntax and commands (conditionals like if-then-else, loops), etc. Applications include writing useful programs in the selected language to solve mathematical problems, or to explain mathematical concepts.

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## IME2113 Developing Computational Thinking In Secondary Mathematics

*Duration: 12 hours*

This course introduces to the learners a new paradigm, Computational Thinking, that results in knowledge access through constructing useful product(s). Being domain-specific, this course focuses on developing computational thinking in secondary mathematics. Apart from the four pillars of Computational Thinking (Decomposition, Pattern recognition, Abstraction, Algorithm Design), the learner will acquire specific lesson design principles that can be applied to craft mathematics lessons that leverage on Computational Thinking. Not a course on coding, this course however serves as good pre-requisite to any coding/programming courses.

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## IME2114 Effective Peer and Self Assessment in Secondary Mathematics

*Duration: 12 hours*

The course aims to equip educators with knowledge and practices of effective peer and self assessment in secondary mathematics. The course will engage participants in deepening their understanding about assessment and examine the merits of non-traditional approaches, specifically, peer and self assessment. Following which participants will engage with hands-on work and enact peer and self assessment in their mathematics instruction.

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## IME2116 Deepening the learning of Algebra in Sec Math

*Duration: 12 hours (including e-learning)*

This course is one of the seven content upgrading courses for PGDE (Lower Secondary) Mathematics teachers who wish to teach Mathematics at upper secondary level. Upper secondary Mathematics teachers are also welcome to attend the course. The course is designed to deepen the teachers' content knowledge in Algebra topics covered at upper secondary level and to discuss the topics in relation to the big ideas in the Singapore mathematics curriculum.

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## IME2117 Deepening the learning of Algebra in Add Math

*Duration: 12 hours (including e-learning)*

This course is one of the seven content upgrading courses for PGDE (Lower Secondary) Mathematics teachers who wish to teach Additional Mathematics at upper secondary level. Additional Mathematics teachers are also welcome to attend the course. The course is designed to deepen the teachers' content knowledge in Algebra topics covered in Additional Mathematics and to discuss the topics in relation to the big ideas in the Singapore mathematics curriculum.

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## IME2118 Deepening the understanding of Calculus in Additional Mathematics

*Duration: 12 hours*

This course is one of the seven content upgrading courses for PGDE (Lower Sec) Mathematics teachers who wish to teach Mathematics at Upper Secondary level. It is also open to PGDE (All Sec) Mathematics teachers who wish to deepen their content knowledge and acquire innovative pedagogical content knowledge (PCK) in teaching Calculus topics in relation to the big ideas in the Singapore mathematics curriculum. The participants will learn about the Fundamental Theorem of Calculus, which is a very big idea in Calculus. They will also learn how to go down to the level of the students to teach Calculus without using the concept of limits and derivation from first principles by guiding students to discover the various formulae for finding the derivatives of power, trigonometric, exponential and logarithmic functions. Last but not least, the participants will learn how functions, notations, measures, diagrams, models and equivalence play an important role in Calculus.

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## IME2119 Deepening the learning of Geometry in Sec Math

*Duration: 12 hours (including e-learning)*

This is one of the three content upgrading courses for PGDE (Lower Secondary) Mathematics teachers who wish to teach Elementary Mathematics at upper secondary level. Lower secondary mathematics teachers who wish to take the Geometry in Secondary Additional Mathematics course should preferably complete this course first. Upper secondary mathematics teachers are also welcome to attend the course to deepen their content knowledge. This course also discusses geometry topics in relation to the big ideas in the Singapore mathematics curriculum.

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## IME2120 Deepening the learning of Geometry in Add Math

*Duration: 12 hours (including e-learning)*

This is one of the four content upgrading courses for PGDE (Lower Secondary) Mathematics teachers who wish to teach Additional Mathematics. Lower secondary mathematics teachers who wish to take this course should preferably complete the inservice course on Geometry in secondary elementary mathematics. Upper secondary additional mathematics teachers are also welcome to attend the course to deepen their content knowledge. This course also discusses the topics in relation to the big ideas in the Singapore mathematics curriculum.

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## IME2121 Deepening the learning of Statistics and Probability in Sec Math

*Duration: 12 hours*

This course deepens the participants' content knowledge in Statistics and Probability topics and discusses the topics in relation to the big ideas in the Singapore mathematics curriculum. The participants will learn how to decide which kinds of statistical diagrams are best suited to represent which types of data, and why proportionality plays an important role in representing data in these statistical diagrams. They will also learn the ideas behind the three types of averages, standard deviation and interquartile range, and how to use these measures of central tendency and spread to describe and compare two sets of data. In addition, they will learn that some statistical measures are invariant under certain conditions. For probability, the participants will learn the different conceptions of probability and how to use different types of probability diagrams to represent the various kinds of possible outcomes. They will also learn how to use proper notations to represent certain concepts and measures in statistics and probability. Last but not least, the participants will learn how statistical thinking is different from mathematical thinking.

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## IME2122 Deepening the learning of Trigonometry in Add Math

*Duration: 12 hours (including e-learning)*

This course discusses the pedagogy and the underlying principles based on sound content knowledge of additional mathematics trigonometry.

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## IME2123 Assessment and metacognition literacy for feedback

*Duration: 9 hours*

This course will provide the experienced A-Level Mathematics teachers with an overview of assessment and metacognition literacy that is critical in eliciting quality feedback in the teaching and learning of A-Level Mathematics.  It will equip participants with both the knowledge and skills to adapt, plan, and implement learning experiences that provide the teachers with the insights and thus better cater to the learning needs of diverse learners in their mathematics classrooms.

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## IME2124 Computational approaches for Mathematical Problem Solving

*Duration: 14 hours (including e-learning)*

This course introduces participants to the range of possibilities of using a common and highly accessible application, MS Excel with VBA, as a computational tool in exploring and learning mathematical concepts, and to solve mathematical problems through computational techniques.

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## The Problem Wheel – A Metacognitive Approach to "Kickstart" Students' Mathematical Problem Solving

*Duration: 12 hours*

This course is to provide primary mathematics teachers with a metacognitive means to "kickstart" the problem-solving process in primary mathematics students.

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## IPE0025 Sports Injury: Prevention and Management (for PE and Sports CCA Teachers)

*Duration: 20 hours*

This course is designed to provide physical education teachers with the fundamental knowledge and skills to understand the growth-related biological aspects, risk factors, causes and mechanisms of injuries in PE and youth sports with a specific emphasis on physical education settings in schools. The course will also include the principles and strategies of prevention and management of injuries in PE and youth sport.

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## IPE0026 Coaching Children in Sports

*Duration: 20 hours (including e-learning)*

This course is designed to equip coaches and teachers with the necessary skills and knowledge in dealing with children who are involved in recreation and developmental sports. This course provides an introduction to the theory of coaching and learning in the school sports setting and will cover various aspects relating to effective coaching of children for training and competition. The course will have a mix of practical and theoretical aspects to equip coaches and teachers the necessary skills for developing basic knowledge and skills for coaching children involved in sports.

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## IPE0027 Coaching Youths in Sports

*Duration: 20 hours*

This course is designed to equip coaches and teachers with the necessary skills and knowledge in dealing with young athletes who are involved in recreation and developmental sports in schools. This course provides an introduction to the theory of coaching and learning in a school sports setting. It covers various aspects relating to effective coaching of young athletes for training and competition. The course will have a mix of practical and theoretical aspects to equip coaches and teachers with the necessary skills for developing basic knowledge and skills to deal with young athletes effectively in sports.

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## IPE0028 Psychological Preparation for Athletes in Sports

*Duration: 20 hours (including e-learning)*

This course helps coaches and teachers become more knowledgeable in terms of the mental demands of sports in competition.  This course also provides an introduction to applied sport psychology in the school setting. This course introduces various mental skills for training to help athletes in training and competition. A mix of practical and theoretical aspects of this course will equip coaches and teachers with the necessary skills for developing basic mental skills training for athletes.

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## IPE0037 Strength and Conditioning for PE and Sports CCA Teachers

*Duration: 20 hours (including e-learning)*

This course is designed to equip participants with research-based knowledge of strength and conditioning and how it can help improve physical fitness, and performance in sports for students and student-athletes. Participants will be taught to design a specific “Strength and Conditioning” training plan using the knowledge in training principles, exercise physiology, plyometric, speed and agility.

You will be assessed for the course.

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## IPE0045 Values and Character Education through PE and Sport and Beyond: The ‘What’

*Duration: 20 hours (including e-learning)*

This course aims to provide participants with an overview of the principles and frameworks used for values, and character development in Physical Education and Sport (PES) and beyond. Participants will gain insights on how values and like skills can be intentional planned and facilitated to their students/athletes during PE lessons and sport programmes through authentic learning experience, guided by Experimental Learning Theory (Kolb, 1984). Effective teaching/coaching strategies based on local and global empirical evidence on how to balance skills and values/character development will also be covered in this course, as well as potential tools that can be used to evaluate the effectiveness of the teaching and learning of values and character in PES and beyond.

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# PSYCHOLOGICAL STUDIES

## IP0001 How to Promote Children's Learning in Informal Contexts?

*Duration: 7 hours (including e-learning)*

In this course, the course participants will engage in interactive, hands-on class activities to deepen their understanding of the 'what, 'how' and 'why' of facilitating and scaffolding children's learning in informal contexts. At the end of the course, the course participants will be able to develop a better understanding of the learning principles and facilitation strategies to help children learn more effectively and meaningfully in informal learning contexts.

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## IP0002 How to scaffold learning effectively for your learners?

*Duration: 7 hours (including e-learning)*

Instructional scaffolding is a process through which the instructor provides supports for the learners to achieve mastery of tasks and knowledge acquisition. The instructor will take into consideration the learners' prior knowledge and skills to help them master more complex and challenging tasks and concepts. Effective scaffolding can motivate and engage learners in deeper, more self-regulated learning. In this course, participants will engage in interactive, hands-on class activities to identify the types of scaffolds as well as apply appropriate scaffolding strategies to meet their learners' needs. At the end of the course, participants will be able to gain a deeper understanding of the principles, approaches and strategies of instructional scaffolding.

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## IP0003 Supporting students with special needs in higher institution of learning

*Duration: 40 hours (including e-learning)*

This course is designed specifically to train teachers to support students with special needs in higher learning institutions. This course introduces participants to developmental and learning challenges faced by students with Autism, Attention Deficit Hyperactivity Disorder, Dyslexia and Executive Function Deficits. The course will equip participants with relevant content knowledge and selected intervention skills to support these students. Participants will have the opportunity to examine case studies and learn effective strategies to support the academic and socio-emotional learning in these students for them to succeed in their journey of higher institution of learning.

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## IP0004 Positivity: Learning to think, feel and act positively

*Duration: 11 hours (including e-learning)*

If robots today can learn, it is imperative for human beings to learn and to benefit from learning to be positive. This workshop discusses the realities of learning to think, feel, and act positively. It aims to empower participants to take creative actions volitionally to deal with stressful and negative situations in real life by transferring theoretical frameworks into practice amidst challenges.

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## IPC0004 Introduction to understanding children with special educational needs

*Duration: 4 hours*

This introductory course is designed to provide participants with theoretical knowledge as well as consultation to understand and to support children with special educational needs (SEN) that they may encounter in their work. Topics include descriptions of some common SEN conditions in children in Singapore and some basic strategies of managing these children.

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## IPC0009 Developing as advocates for joyful teaching and learning

*Duration: 3 hours*

Learn how you can be advocates for joyful teaching and learning, and use this knowledge to develop yourself as an advocate for whatever you are passionate about.

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## IPC0010 Let's Talk: Importance of Sleep and Emotional Well-being

*Duration: 7 hours*

The workshop will cover the importance of sleep and its effects on our overall wellbeing. Workshop will also discuss simple tips of health sleep habits and a hands on practice of relaxation exercise.yourself as an advocate for whatever you are passionate about.

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## IPC0011 Let's Talk: Self Care in Challenging Period

*Duration: 7 hours*

The workshop aims to psychoeducate participants on the importance of self care in the new normal. In addition, as educators in a school setting, some of the participants may overlooked the need for self-care. Therefore, the workshop aims to emphasize on the simple strategies on self-care

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## IPC0012 Supporting self- and peer assessment in the lower primary years

*Duration: 7 hours*

Learn how you can support your lower primary students to engage in self- and peer assessment in their learning, and advocate for meaningful assessment practices.

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## IPC0013 Supporting students with SEN in the mainstream classrooms

*Duration: 3 hours*

This is a course which is customised for individual mainstream schools to equip their educators with an understanding of the various types of SEN and empower them to be better able to support their students with SEN in the classrooms. their learning, and advocate for meaningful assessment practices.

## IPC0014 Leading Differentiation in Schools (DI for Teacher-Leaders Guiding Schools)

*Duration: 6 hours (including e-learning)*

This course first seeks to help teacher-leaders guide fellow teachers in examining individual conceptions of differentiation. It then helps teacher-leaders develop an informed awareness of cognitive and affective aspects of diverse needs and use the Principles of Differentiation to enhance provisions for diverse learners in regular classrooms. Topics will include an overview of developing a classroom culture that recognizes the cognitive and affective needs in diverse classrooms, issues around the identification and assessment of teachers' conceptions of differentiation, the rationale and application of the principles of differentiated instruction. Ultimately, the course helps develop a school-vision to guide and support the adoption of differentiated instruction.

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## IPC0015 Supporting students with special needs in higher institution of learning

*Duration: 30 hours*

This 5-day course is designed specifically to train teachers to support students with special needs in higher learning institutions. This course introduces participants to developmental and learning challenges faced by students with Autism, Attention Deficit Hyperactivity Disorder, Dyslexia and Executive Function Deficits. The course will equip participants with relevant content knowledge and selected intervention skills to support these students. Participants will have the opportunity to examine case studies and learn effective strategies to support the academic and socio-emotional learning of these students for them to succeed in their journey of higher institution of learning.

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## IPS0020 Progress Monitoring and Data-based Decision Making

*Duration: 16 hours*

This course will equip Allied Educators (Learning and Behavioural Support) or AEDs (LBS) with an understanding of the principles of Response-To-Intervention (RTI) so that they will be better able to identify pupils with reading difficulties in the context where a whole school approach is taken in reading support.

You will be assessed for the course.

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## IPS0003 Thriving Teachers,Thriving Students: Social-Emotional Components

*Duration: 16 hours*

Social and emotional competencies aren't secondary to the mission of education, but are concrete factors in the success of teachers, students, and schools. (Jones, Bouffard & Weissbourd, 2013). It is not only intuitive, but research has clearly indicated that social-emotional competencies influence everything from teacher-student relationships to classroom management to effective instruction to teacher burnout (Jennings and Greenberg, 2009). Teachers' SEL competencies influence students in at least three ways. First, SEL influences the quality of teacher-student relationships. Teachers who are good at regulating their emotions are more likely to display positive affect and higher job satisfaction (Brackett, et al., 2010). When students have high-quality relationships with teachers, they have better social adjustment and higher academic competence (Mashburn et al., 2008; Raver, Garner, & Smith-Donald, 2007). Second, teachers model SEL skills for students – intentionally or not. Students learn from the way teachers manage and maintain control of selves and classroom, the ways they stay focused, and shift tactics and be adaptable and flexible and responsive. Third, teachers' SEL abilities likely influence their classroom organization and management – a positive environment that is built on social trust. Furthermore, teachers with stronger SEL competencies are more likely to implement SEL programmes targeted to students with greater fidelity. Practices and policies to support and foster teachers' own SECs must not be neglected or overlooked.

This workshop explores how enhancing educators' social and emotional competency (SEC) can help increase their engagement in teaching, strengthen their relationships with students, and improve their stress management, all of which lead to improved student outcomes. Through interactive exercises, participants examine the connection between the 5 SEL competencies of self-awareness; self-management; social awareness; social management; responsible decision-making and effective teaching; learn to identify early signs of stress; reconnect to their identity as a teacher and develop a self-care plan for managing stress. Participants review the latest research related to adult SEC and how it can support their effectiveness as educators. This workshop is highly active, brain-based, and experiential.

You will be assessed for the course.

## IPS0008 Empowering Student Social and Emotional Competencies

*Duration: 16 hours*

A meta-analysis of 213 programmes, primarily covering three decades of research, found that social and emotional learning interventions that address social-emotional competencies increase students' academic performance by 11 percentile points, as compared to students who did not participate in such SEL programmes (Durlak et al., 2011). The social and emotional learning programmes also reduced aggression and emotional distress among students, increased helping behaviors in school, and improved positive attitudes toward self and others (Durlak et al., 2011). Effective SEL programmes addressing the five key competencies of self-awareness, self-management, social awareness, relationship management and responsible decision-making explicitly and sequentially, and used active-learning techniques to engage young people in developing an understanding of them. There are several person-centered reasons why SEL can promote academic success. Self-regulation, the ability to control and manage thoughts, feelings, and behaviors, has been linked to academic achievement in numerous studies. Students who are more self-aware and confident about their learning capacities try harder and persist in the face of challenges (Aronson, 2002; cited in Durlak et al., 2011). Students who set high academic goals, have self-discipline, motivate themselves, manage stress, and organise their approach to work learn more and get better grades (Duckworth & Seligman, 2005; Elliot & Dweck, 2005; cited in Durlak et al., 2011). Finally, students who use problem-solving skills to overcome obstacles and make responsible decisions about studying and completing homework do better academically (Zins & Elias, 2006; cited in Durlak et al., 2011). Teachers and schools must take the responsibility to foster and to strengthen students' personal competencies and social support networks and their social-emotional competencies in self and other management. SEL can help to unleash the potential within positive and encouraging school environments to support students' well-being and success.

You will be assessed for the course.

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## IPS0013 Cultivating Confidence: Classroom Connections

*Duration: 16 hours*

This course presents an overview of the necessary foundational process we call confidence building with students. When students lack the foundation of confidence, numerous secondary symptoms occur, often causing great strain on the effectiveness and productivity of teaching and learning in the classroom. Teachers are well aware of how great the classroom environment is for those students who have a sense of confidence. They participate, are motivated, have positive outlooks, willing to venture out, willingness to try new things, and enjoy doing their work and learn. Confidence building with young people is too crucial to leave it up to trial and error. This course seeks to assist teachers in this crucial task. Building confidence in students should be the first responsibility of every teacher, since very little can take place without it. Such responsibility requires a complete understanding of all the pitfalls and options available.

You will be assessed for the course.

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## IER0007 Designing and Assessing Students' Digital Storytelling

*Duration: 21 hours*

Emerging new media (e.g., mobile and web-based interactive platforms for creating, sharing, discussing and modifying user-generated content), and the rapidly changing needs and capabilities of students, place rising demands on educators to rethink their classroom practices. But how can we understand and draw on the presence of digital technologies for contemporary meaning-making and communication using a variety of representational formats (e.g., writing, images, gestures and sounds)? Based on the long-standing use of stories in societies and cultures to inform, educate and entertain; this in-service course explores the ground between new media and teaching through a hands-on consideration of the potentials of subject- or topic-based digital storytelling by students.

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# SCIENCE

## IN0001 Micro:bit Workshop for TSOs and Teachers

*Duration: 6 hours*

This course is an introduction to the use of the BBC Micro:bit microcontroller in science and STEM-related learning activities in schools, with a focus on technical preparation and support. This basic course is aimed at technical support officers (TSO) as well as upper primary and secondary teachers interested in getting started with the Micro:bit. No prior experience with the Micro:bit required. This course will equip participants with the essential skills to set up and code simple but functional apps on the Micro:bit, as well as provide the familiarity to use it for science and STEM-related activities.

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## IN0002 New Topics for H2/H3 Physics

*Duration: 12 hours (including e-learning)*

This course aims to introduce the new topics in the JC physics curriculum. The new topics are related to fields and energy, quantum physics and waves, and special relativity. The course aims to help participants with the new topics through briefings, demos, hands on activities and through discussion.

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## IN0003 Innovations in Design and Practices for Primary Science

*Duration: 39 hours*

The course aims to develop the pedagogical content knowledge of primary science teachers by engaging them in discussing various difficulties in teaching various primary science topics/concepts. Drawing on contemporary learning theories and research findings, various innovative strategies, and activities for teaching primary science will be taught through lectures, tutorials, and laboratory work.

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## IN0004 Selected Topics for Primary Science Teaching (Physical Science)

*Duration: 39 hours (including e-learning)*

This course deals with the theoretical and practical aspects of the physical science curriculum in primary schools. The topics to be covered include basic physical topics, linear motion, forces, temperature and heat, work and energy, electrical systems, magnetism, and light. This course also examines pedagogical aspects of teaching physical science topics in Primary Science. This course is organised for SPED educators with or without science background, but will not specifically cover special education issues. However, participants will be given opportunities to discuss and share pedagogical best practices in the teaching of physical science topics.

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## IN1002 Overview of the revised 2023 primary science curriculum

*Duration: 3 hours*

Given the new features and emphases of the revised primary science curriculum starting in 2023, it is necessary that teachers in Singapore are familiar with all of its distinctives such as the Practices of Science. This 3-hour course will walk participants through the rationale for these changes as well as practise adapting lessons to meet these learning goals.

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## IN1003 Inquiry-based Learning lessons as Differentiated Instruction in primary science

*Duration: 2 hours*

Inquiry-based Learning (IBL) has been a critical idea in teaching and learning science in school. Differentiated Instruction in Singapore has also been focused on responsive teaching based on diverse needs of learners. This workshop emphasises the importance of IBL based on the revised science curriculum framework (MOE, 2019) and suggests a way of infusing DI into IBL lessons.

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## INS0046 Sustainable Living: Legacy for Future Generations (Introduction)

*Duration: 7 hours*

This course is designed to provide participants with theoretical knowledge as well as hands-on practice to build competencies and resources in sustainable resource management for individuals and families. Topics include stresses on the environment, society and resources, sustainable household/ textile/food consumption, usage and management.

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## INS0048 Integrated STEM to Promote Humanistic Knowledge in the 21st Century

*Duration: 18 hours*

21st century learning entails developing humanistic knowledge that values ethical and emotional awareness, cultural competence and life-long learning attitudes. Integrated STEM lessons with a focus on user-centric designs can help to support the development of humanistic knowledge in learners. In this course, teachers will learn how to design, enact and assess user-centric integrated STEM lessons for students. The integrated STEM lessons will be grounded in the topics of textiles, computational thinking, and sewing to offer an integrative STEM learning experience.

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## INS0049 Integrated STEM Curriculum to Promote Foundational, Meta and Humanistic Learning (Code to Sew)

*Duration: 24 hours (including e-learning)*

In this course, participants will experience the “Code to Sew” programme that is co-designed by meriSTEM@NIE and BERNINA (Singapore) Pte Ltd to address 21st century learning goals through empowering learners to become STEM (science, technology, engineering and mathematics) literate citizens. Code to Sew is a programme that comprises coding and computational thinking, science of materials, and sewing & embroidery. The programme aims to broaden and deepen learning experiences in areas that are not provided in regular school curriculum. This programme has been piloted and implemented in Singapore schools and positive learning outcomes were found. During the course, there will be curricular discussions about ways to design and implement integrated STEM lessons that are problem-, solution- and user-centric in classrooms.

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## INS1015 Integrated Thematic Primary Science

*Duration: 12 hours*

This course seeks to equip primary science teachers with pedagogical and content knowledge for teaching the five themes (Diversity, Cycles, Energy, Systems and Interaction) in the Primary Science (2014) Syllabus. The course is spread over two full days where relevant content knowledge will be reviewed in the context of inquiry science instruction and assessment. The overarching focus will be on the integrated nature of the themes, on gaining scientific literacy, and on the relevance of science to the everyday life of the child.

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## INS1022 Science Inquiry Projects (Secondary): From Development to Analysis

*Duration: 6 hours*

This course is designed for secondary school science teachers who are mentoring science inquiry projects. Science inquiry projects offers students an integrated and authentic way to learn the epistemic practices of science which includes collecting evidence, making sense of evidence, ways of proposing knowledge, communicating knowledge, evaluating knowledge and legitimising the knowledge. Students involved in science project learn both the subject matter knowledge of science as well as the processes involved in arriving at the scientific knowledge. Proper mentoring throughout the science project would enhance students’ motivation, interest and learning in science.

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## INS1025 Teaching of Respiratory System in Humans for Primary Science

*Duration: 9 hours (including e-learning)*

This course is designed for primary school science teachers. The parts of the human respiratory system include the trachea, the lungs, the rib cage and the diaphragm. In this course, participants will learn about the functions of each part of the respiratory system and relate this to the adaptations of the system to carry out the function of respiration. Participants will also be engaged in activities that will enable them to teach the topic of respiration more effectively.

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## INS1026 Teaching of the Cardiovascular System in Humans for Primary Science

*Duration: 9 hours (including e-learning)*

This course is designed for primary school science teachers. In this course, participants will learn the anatomy of the human heart and blood vessels and their relationship to the functions of the circulatory system. Participants will also be engaged in activities that will enable them to teach the topic of transport in humans more effectively.

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## INS1027 Integrated STEM for Primary Level (Part 1)

*Duration: 6 hours*

STEM (science, technology, engineering, mathematics) tasks should explicitly integrate two or more of the four S-T-E-M disciplines. In this course, participants will learn how the meriSTEM@NIE STEM Quartet framework is used to guide the design and implementation of a task that integrates all four disciplines in solving an authentic problem. During the course, participants will have hands-on experience in designing and building a stationery organiser prototype. The conceptual, epistemic and social affordances of the STEM task will be discussed.

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## INS1028 STEM Applications in Teaching Primary Science 1

*Duration: 3 hours*

Does dark coloured clothing really absorb more light? How much more light energy is absorbed and converted into heat for dark coloured clothing as compared to light coloured clothing? In this course, participants will have hands-on experience with PocketLab sensors, products of STEM applications, to investigate the relationship between heat conductance, light and colour. Instead of learning about the relationship qualitatively, actual measurements will be taken and conclusions will be drawn from collected evidence.

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## INS1029 Engaging Students' Natural Curiosity to Deepen Understanding of Electrical System (Part 1)

*Duration: 4.5 hours (including e-learning)*

The first of the series is a 3-hour workshop designed for teachers to engage students' natural curiosity through understanding the big ideas of the electricity curriculum. Participants will acquire a more in-depth knowledge of the primary science curriculum on electricity by collectively creating a curriculum map that connects different pieces of knowledge on electricity, drawing connections of facts towards the big ideas in the curriculum. The electricity curriculum at secondary level will be brought in to draw essential connections to the primary curriculum map. The workshop will then progress to analyse a pool of students' questions and examination questions in relation to the big ideas and facts derived in the curriculum map.

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## INS1030 Engaging Students' Natural Curiosity to Deepen Understanding of Electrical System (Part 2)

*Duration: 4.5 hours (including e-learning)*

This is a 3-hour workshop designed for teachers to design practical examples of knowledge building inquiry activities and instructional strategies based on challenging PSLE question on the topic of electrical circuit. Participants will use a set of knowledge building principles to rationalise their design and interactions in class to understand what it means to engage students' natural curiosity.

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## INS1031 Engaging Students' Natural Curiosity to Deepen Understanding of Electrical System (Part 3)

*Duration: 4.5 hours (including e-learning)*

This is a 3-hour workshop designed for teachers to engage in systematic analyses of students' questions and explanations to design authentic formative assessment approaches. This session on assessment and evaluation features practical tools and examples of assessment practices and activities that can be used by both students and teachers. Throughout the sessions, there will be discussions on how to develop a Knowledge Building culture in the classroom as well as ideas for great knowledge building hooks and ways to sustain the momentum for student-driven inquiry. These discussions allow teachers to apply the knowledge gained in this course to other topics in the primary science syllabus.

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## INS1032 Science inquiry projects (Primary): from development to analysis

*Duration: 6 hours*

This course is designed for primary school science teachers who are mentoring science inquiry projects. Science inquiry projects offer students an integrated and authentic way to learn the epistemic practices of science which includes collecting evidence, making sense of evidence, ways of proposing knowledge, communicating knowledge, evaluating knowledge and legitimising the knowledge. Students involved in science projects learn both the subject matter knowledge of science as well as the processes involved in arriving at the scientific knowledge. Proper mentoring throughout the science project would enhance students' motivation, interest and learning in science.

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## INS1033 Teaching Primary Science in Inclusive Classrooms

*Duration: 6 hours*

Science lessons contain a lot of scientific jargon. Hence, it can be challenging for students, especially those with reading and writing difficulties, to learn science. In this course, participants will learn some basic strategies useful for the teaching of science in primary classrooms.

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## INS1036 Primary Science Content Updating: Frictional Force and Air Resistance

*Duration: 4 hours (including e-learning)*

This course is customised for the content updating of primary school science teachers to understand, appreciate and apply the concepts and principles of frictional force and air resistance in primary school science syllabus. The participants will learn how to use the scientific inquiry-based approach in teaching the topic of the usefulness and problems due to frictional force and air resistance by exploring and carrying out laboratory activities first and then, followed by explanation of the observations. The simple and yet effective activities on friction and air resistance are customized for teachers to learn and to use them for their own teaching in classrooms. The teachers will also learn how to design questions on this topic to evaluate the learning of students.

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## INS1037 Primary Science Content Updating: Electrical System

*Duration: 4 hours (including e-learning)*

This 4-hour course on electrical system is customised for primary school science teachers to update their content knowledge and skills in understanding and applying the concepts, principles and uses of electricity in primary school science syllabus. The participants will learn how to use the scientific inquiry-based approach in teaching the topics of electrical circuits and their components, electrical current and voltage, and uses of electricity by exploring and carrying out laboratory activities using lab apparatus, followed by explanation of these observations. The simple and yet effective activities on electricity are designed for teachers to learn and to use them for their own teaching in classrooms. The teachers will also learn how to design questions on this topic to assess the learning of students on the electrical system.

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## INS1038 Primary Science Content Updating: Forces

*Duration: 4 hours (including e-learning)*

This course is designed and customised for primary school science teachers to understand, appreciate and apply the concepts and principles of forces in primary school science syllabus. The participants will learn how to use the scientific inquiry-based approach in teaching the topic of the types and effects of forces by exploring and carrying out laboratory activities using simple materials, followed by explanation of these observations. The simple and yet effective activities on forces are designed for teachers to learn and to use them for their own teaching in classrooms. The teachers will also learn how to design questions on this topic to evaluate the learning of students.

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## INS1039 Primary Science Content Updating: Heat energy

*Duration: 4 hours (including e-learning)*

The course on heat energy is customised for primary school science teachers to update their content knowledge and skills in understanding and applying the concepts and principles of heat in primary school science syllabus. The participants will learn how to use the scientific inquiry-based approach in teaching the topic of the sources and properties of heat energy by exploring and carrying out laboratory activities using simple apparatus, followed by explanation of these observations. The simple and yet effective activities on heat energy are designed for teachers to learn and to use them for their own teaching in classrooms. The teachers will also learn how to design questions on this topic to assess the learning of students on heat energy.

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## INS1040 Primary Science Content Updating: Kinetic Energy and Potential Energy

*Duration: 4 hours (including e-learning)*

The kinetic energy and potential energy course is customised for primary school science teachers to update their content knowledge and skills in understanding and applying the concepts and principles of energy in primary school science syllabus. The participants will learn how to use the scientific inquiry-based approach in teaching the topic of the kinetic energy and types of potential energy, their sources, and energy conversion by exploring and carrying out laboratory activities using simple lab apparatus, followed by explanation of these observations. The simple and yet effective activities on kinetic and potential energies are designed for teachers to learn and to use them for their own inquiry-based teaching in classrooms. The teachers will also learn how to design questions on this topic to assess the learning of students on these energies.

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## INS1041 Primary Science Content Updating: Light energy

*Duration: 4 hours (including e-learning)*

This course is offered to primary school science teachers to update their content knowledge and skills in understanding and applying the concepts and principles of light energy in primary school science syllabus. The participants will learn how to use the scientific inquiry-based approach in teaching the topic of the sources and properties of light energy by exploring and carrying out laboratory activities using simple materials, followed by explanation of these observations. The simple and yet effective activities on light energy are designed for teachers to learn and to use them for their own teaching in classrooms. The teachers will also learn how to design questions on this topic to evaluate the learning of students on light energy.

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## INS1042 Primary Science Content Updating: Magnet and Magnetism

*Duration: 4 hours (including e-learning)*

This course serves as a content updating platform for primary school science teachers to understand, appreciate and apply the concepts and principles of magnets and magnetism in primary school science syllabus. The participants will learn how to use the scientific inquiry-based approach in teaching the topic of magnets and magnetism by exploring and carrying out laboratory activities first and then, followed by explanation of the observations. The simple and yet effective activities are customized for teachers to learn and to use them for their own teaching in classrooms. The teachers will also learn how to design questions on magnets and magnetism to evaluate the learning of students.

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## INS1043 Primary Science Content Updating: Sound Energy and Electrical Energy

*Duration: 4 hours (including e-learning)*

The course on sound energy and electrical energy is customised for primary school science teachers to update their content knowledge and skills in understanding and applying the concepts and principles of sound and electrical energies in primary school science syllabus. The participants will learn how to use the scientific inquiry-based approach in teaching the topic of the sources and properties of sound and electrical energies by exploring and carrying out laboratory activities using simple apparatus, followed by explanation of these observations. The simple and yet effective activities on sound energy and electrical energy are designed for teachers to learn and to use them for their own teaching in classrooms. The teachers will also learn how to design questions on this topic to evaluate the learning of students on these energies.

## INS1048 Primary Science Content Updating: Diversity of Living Things

*Duration: 5 hours (including e-learning)*

This course is customised for the content updating of primary school science teachers to understand, appreciate, and apply the knowledge concerning diversity of living things in primary school science syllabus. The participants will learn how to use the scientific inquiry-based approach in teaching the topic of the usefulness of knowledge on diversity of living things and misconceptions on local common biodiversity through e-learning, in-class discussions, and an outdoor session around NIE campus to identify and elaborate on the common local biodiversity that can often be found in most school gardens. The information presented is customised for teachers to learn and to use them for their own teaching in classrooms.

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## INS1049 Creating Alternative Assessments in Primary Science – Theory into Practice

*Duration: 10 hours (including e-learning)*

Through online instruction, this course helps participants apply the principles of alternative assessments in primary schools. In particular, participants will co-develop various alternative assessments in the context of primary science teaching and learning for their school. Through close guidance from the instructors, participants will plan and implement alternative assessments as well as practise designing appropriate rubrics for these tasks.

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## INS1050 Differentiated Learning Activities in School Science Lessons

*Duration: 6 hours*

This course (for primary and secondary science teachers) includes a revision on the concept(s) related to Differentiated Instruction (DI) in school science lessons, a focus on the Practice Pillar of DI (Tomlinson, 2020) and aims to provide science teachers with a structured approach to help them implement differentiated teaching, learning and assessment-related ideas in class or in the laboratory.

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## INS1051 Inquiry-based Learning for Primary Science Teachers

*Duration: 12 hours*

In school science, inquiry is both an approach for students to learn scientific knowledge (inquiring to learn) and to learn the practices of scientific inquiry (learning to inquire). This introductory course seeks to develop science teachers' competency and confidence in applying inquiry-based learning (IBL) approaches in their science classrooms.

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## INS1052 Teaching of the human respiratory and circulatory systems

*Duration: 9 hours*

This course is designed for primary science teachers. In this course, participants will learn about the structure and function relationship of the human respiratory and cardiovascular systems. Participants will learn how to teach these two systems more effectively at the primary level.

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## INS1053 Differentiating teaching across the subjects

*Duration: 6.5 hours*

This hands-on workshop seeks to enhance the everyday practice of Differentiated Instruction among subject teachers at the primary level. It will introduce teachers to the theories surrounding the 3Cs [cultivate, choice, & challenge] of differentiating challenging and meaningful tasks. Teachers will work collaboratively to plan, implement, and assess a range of differentiated tasks in their subject areas.

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## INS1054 Primary Science Upgrading Course (Physical Science)

*Duration: 9 hours*

This course covers concepts of physical science at the primary science level, including forces, various forms of energy, electrical systems, and magnetism.

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## INS2104 Pollution Experiments Using Ecotoxicology Biomarkers for Schools

*Duration: 24 hours*

This course combines project-based learning that integrates biology and chemistry in experimental field studies on ecotoxicology, and collaboration with a Singapore government agency (NParks) in a citizen science programme. Participants (teachers with their pupils) will experience the rigour of content-based research through authentic experimental protocols used in field bio-monitoring associated with environmental health indicators.

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## INS2134 Science Inquiry-Based Learning

*Duration: 6 hours*

This is a school-based in-service course customised specifically to update science teachers at a secondary school on the development of inquiry-based instructional strategies (including assessment-related learning activities) and student-centric learning activities. Participants will be introduced to various science inquiry-based learning approaches and also be involved in various inquiry-learning activities, including using and crafting science learning tasks and assessment items to engage students in inquiry learning of the various science concepts and process skills described in the latest science curriculum.

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## INS2157 Assessment as Learning (AaL) in Secondary Science

*Duration: 7 hours*

Assessment as Learning (AaL) represents a highly desirable advance over Assessment for Learning (AfL) methods to improve student understanding. This is because AaL or self-assessment requires that learners take control and be in-charge of their own learning to a greater extent with long-term gains in knowledge and self-autonomy. This course will therefore provide an overview of AaL theory and introduce practical techniques for its implementation in local schools. It will also assist teachers to conduct simple action research to monitor teacher AaL facilitation as well as the learning outcomes of students.

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## INS2170 Edible Garden based STEM Education for Schools

*Duration: 6 hours*

The in-service course, Edible garden-based STEM education for schools is specially designed for all primary and secondary school teachers in enhancing their competency in teaching science and mathematics topics with the integration of real-world applications in engineering and technology. The STEM topics are pitched at the upper primary and lower secondary science and mathematics syllabi.

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## INS2171 Designing STEM Tasks for Biology Instruction

*Duration: 6 hours*

STEM (Science, Technology, Engineering and Mathematics) education provides a platform to integrate problem-solving competences relevant to solve problems in the 21st century. As such, it is of fundamental importance to equip students with knowledge of STEM disciplines so that they can contribute meaningfully as citizens in the 21st century. To create opportunities for students to engage in STEM, teachers need to be able to craft meaningful tasks. In the workshop, participants will engage with three ready-made STEM tasks related to the topics of homeostasis, digestion and photosynthesis. Upon completion of these tasks, the participants will craft their own STEM tasks using the Sense-Making Model (Schwarz, Passmore & Reiser, 2017) and engage in peer critique.

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## INS2172 Science as Practice - Scientific knowledge: Truth and Myths

*Duration: 6 hours*

This is the first course in a series of three courses aimed at helping science educators understand the construct of Science as Practice. In this six-hour course, participants will examine the characteristics of scientific knowledge, and how scientists know what they know. Understanding what scientific knowledge is and what it is not forms an essential first step towards teaching science. Unless we develop an intimate understanding of what scientific knowledge is and how it comes about, educators will not be able to create authentic learning opportunities to enable students to learn science well.

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## INS2173 Science as Practice - Negotiating Scientific Practices: What and How?

*Duration: 6 hours*

This is the second course in a series of three courses aimed at helping science educators understand the construct of Science as Practice. Participants of this course would have knowledge of the characteristics of scientific knowledge, and how scientists know what they know. Building on that knowledge, in this six hour course, participants will familiarize themselves with the current debates scholars are engaged in regarding science as practice. They will also examine a proposed framework for science as practice and compare this with current construct of science as inquiry. Actual practices of science in science classrooms will also be shared with participants.

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## INS2174 Science as Practice - Putting Science as Practice into practice

*Duration: 6 hours*

This is the third course in a series of three courses aimed at helping science educators understand the construct of Science as Practice. Participants of this course would have completed the beginners and intermediate courses. The participants would have knowledge of the nature of scientific knowledge, the current diabetes about science as practice and a possible framework for implementing science as practice. In this six hour course, participants will work together in pairs to craft units of work using a science as practice framework. These units of work will be critiqued by other participants for improvement.

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## INS2178 Teaching Science as a Human Endeavour: Why, What, How?

*Duration: 6 hours*

This course will help teachers better understand and be equipped to teach science using a thematic approach at the lower secondary level. Teachers will learn to leverage on the strength of a thematic approach to plan and implement lessons (including practical work) to develop core Ideas, practices of science, values, ethics and appropriate attitudes in their students.

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## INS2179 Micro:bit STEM 1: Getting Started

*Duration: 3 hours*

This course is the first of a three-part series on using the BBC Micro:bit microcontroller in STEM-related activities. This novice-level course is aimed at upper primary and secondary teachers interested in getting started on learning about and coding for the Micro:bit. No prior experience with the Micro:bit is required. This course will equip participants with the essential skills to set up and code simple but functional apps on the Micro:bit as well as provide the familiarity for use in STEM-related activities covered in the next course in the series.

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## INS2180 Micro:bit STEM 2: Making Simple Scientific Instruments

*Duration: 3 hours*

This course is the second of a three-part series on using the BBC Micro:bit microcontroller in STEM-related activities. This course is aimed at upper primary and secondary teachers interested in designing school-based STEM activities that utilise the Micro:bit. Making use of an array of built-in sensors as well as external add-on sensor modules, simple scientific instruments can be constructed. In making and coding such devices that sense and/or measure real-world phenomena, learners have the opportunity to connect and apply their knowledge in science, technology and mathematics in a meaningful way. Basic familiarity with coding for the Micro:bit would be useful. It would be beneficial if participants can attend the first course in this series beforehand.

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## INS2181 Micro:bit STEM 3: Datalogging

*Duration: 3 hours*

This course is the third of a three-part series on using the BBC Micro:bit microcontroller in STEM-related activities. This course is aimed at upper primary and secondary teachers interested in designing school-based STEM activities that utilise the Micro:bit as a platform for recording sensor data that can be used for analytical purposes. This course builds on the second course in the series, hence, participants should have attended Micro:bit STEM 2 or else be familiar with the use of external electronic sensor modules and comfortable with coding for the Micro:bit. Developing a datalogger based on the Micro:bit gives learners the opportunity to connect and apply their knowledge in science, technology and mathematics in a concrete way while equipping them with the skills and potential to innovate and develop whatever device or product they can imagine.

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## INS2182 Assessing Practices of Science in Lower Secondary N(A) and N(T)

*Duration: 8 hours (including e-learning)*

Science process skills (SPS) can be assessed through the use of carefully crafted items. In this course, participants will gain an awareness of the types of items that lower secondary students in the Normal Academic / Normal Technical (NA/NT) streams find easy or challenging, and learn how to construct MCQ items to assess various Science Process Skills (SPS).

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## INS2183 Exploring Diversity through Sustainability

*Duration: 6 hours*

The Lower Secondary Science (LSS) curriculum is designed as integrated science where topics from the three disciplines of science are organised around themes. Each of the themes of Diversity - Models, Systems and Interactions - consists of topics from biology, chemistry and physics. In this course, we focus on deepening the pedagogical content knowledge for the topics under the theme of Diversity using the CoRe framework.

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## INS2184 Exploring Interactions through Climate Change

*Duration: 6 hours*

The Lower Secondary Science (LSS) curriculum is designed as integrated science where topics from the three disciplines of science organised around themes. Each of the themes of Diversity - Models, Systems and Interactions - consists of topics from biology, chemistry and physics. In this course, we focus on deepening the pedagogical content knowledge for the topics under the theme of Interaction using the CoRe framework.

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## INS2185 Exploring Models through Emerging Technology

*Duration: 6 hours*

The Lower Secondary Science (LSS) curriculum is designed as integrated science where topics from the three disciplines of science organised around themes. Each of the themes of Diversity - Models, Systems and Interactions - consists of topics from biology, chemistry and physics. In this course, we focus on deepening the pedagogical content knowledge for the topics under the theme of Models using the CoRe framework.

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## INS2186 Exploring Systems through the Science behind Healthcare

*Duration: 6 hours*

The Lower Secondary Science (LSS) curriculum is designed as integrated science where topics from the three disciplines of science organised around themes. Each of the themes of Diversity - Models, Systems and Interactions - consists of topics from biology, chemistry and physics. In this course, we focus on deepening the pedagogical content knowledge for the topics under the theme of Systems using the CoRe framework.

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## INS2190 Integrating STEM into Lower Secondary Science

*Duration: 16 hours (including e-learning)*

STEM (science, technology, engineering, mathematics) tasks should explicitly integrate two or more of the four S-T-E-M disciplines. In this course, participants will learn how the meriSTEM@NIE STEM Quartet framework is used to guide the design and implementation of a task that integrates all four disciplines in solving an authentic problem. During the course, participants will have hands-on experience in designing and implementing an integrated STEM task to solve a real-world problem. Learning objectives from science, mathematics, and design and technology will be addressed in the task. The conceptual, epistemic and social affordances of the STEM task will be discussed.

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## INS2197 Inquiry-based Learning for 'A' Level Science Teachers

*Duration: 6 hours*

In school science, inquiry is both an approach for students to learn scientific knowledge (inquiring to learn) and to learn the practices in scientific inquiry (learning to inquire). As scientific inquiry lies at the heart of the Singapore science education framework, this introductory course seeks to develop science teachers' competency and confidence in applying inquiry-based learning (IBL) approaches in the science classrooms.

This course will be offered at the request of individual schools or at the cluster level. Please contact course coordinator to express your school/cluster's interest.

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## INS2201 STEM Tasks with Chemistry Applications 1

*Duration: 9 hours (including e-learning)*

STEM is the acronym for Science, Technology, Engineering and Mathematics. In this course, the participants will learn about the different approaches to integrating the four disciplines to achieve multi-, inter- and/or trans-disciplinary curriculum. They will have hands-on with a STEM task that makes use of several chemistry concepts. Following the hands-on experience, they will design STEM tasks with chemistry applications.

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## INS2202 Teaching Disciplinary Ideas in Physics at 'O' Level

*Duration: 6 hours*

Discplinary ideas of Physics are "big ideas" that can be used to explain, analyse, and make sense of the physical world. Through understanding disciplinary ideas, students develop a coherent view of the conceptual framework of scientific knowledge. This, in turn, facilitates students' learning of science.

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## INS2203 Tackling Food and Nutrition Essay Questions

*Duration: 2.5 hours*

Essay questions (open-ended questions) made up 45 percent of the marks in the GCE Food and Nutrition (F & N) 'O' Level Paper 1, a 2-hour examination written paper. Tackling essay questions require high level cognitive skills from students as these questions are not straight forward but a hybrid of information from various topics. F & N Students are often very stressed by this segment of the exam paper because of difficulties in recalling knowledge, linking knowledge from various parts of the textbooks and also limitations in writing skills. In this course, participants will be guided on activities that will help them facilitate the teaching of essay writing. These activities are designed to scaffold the essay writing process, helping students memorise content with understanding, providing students will the basic skills to organise an essay, and select appropriate content from various topics. Participants will also work on making essay-writing templates that are customised for their students.

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## INS2204 Introduction to Medicinal Food

*Duration: 3 hours*

This course introduces the concept of using food as medicine. We will look into how food can be important in preventative health as well as assistance in the management of certain chronic diseases. The course is designed to provide participants with theoretical knowledge on information on common food with medicinal values.

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## INS2205 Augmented Reality (AR) Strategies to Engage Students in the Learning of H3 Molecular Stereochemistry

*Duration: 6 hours*

The course aims to equip educators with effective Technology Enabled Learning (TEL) strategies they may use to engage chemistry students in the learning of molecular stereochemistry. The course will facilitate participants in the application of AR tools on a mobile device to the teaching and learning of conformational and configurational isomerism. The AR platform allows learners to visualise and translate between 2D and 3D representations of molecules and provides an interactive environment for the learning process.

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## INS2208 Facilitating Integrated STEM Lessons

*Duration: 3 hours*

Designing meaningful students' learning experiences in integrated STEM lessons require attention to three keys of (1) planning meaningful group discussions, (2) helping students to identify problems and trade-offs, and (3) giving specific feedback to students' ideas and artefacts. In this workshop, participants will learn strategies to facilitate integrated STEM learning experiences that are more student-centred.

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## INS2209 Integrated STEM lessons to Understand Scientific Models and Modelling

*Duration: 3 hours*

In this course, the participants will acquire the knowledge and skills needed to design and conduct integrated STEM lessons that illustrate the idea of scientific modelling. Specifically, the participants will learn how to perform simple predictive coding. They will gain lesson ideas on how to use predictive coding to develop computational thinking. They will appreciate the integration of mathematics, science, and technology in building models – a practice that scientists, mathematicians, and computer scientists engage to create models for making predictions, construct explanations, and illustrate concepts. The participants will appreciate that models are constructed and hence, can be subjected to change over time.

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## INS2210 Understanding and Designing Integrated STEM Curriculum

*Duration: 12 hours*

Integrated STEM learning offers ways to overcome isolation and fragmentation of knowledge through offering opportunities for learners to learn in comprehensive, innovative and cohesive manner in a world that is increasingly reliant on STEM artefacts. Engagement with problems, and design refinements is one way for students to develop the necessary 21st century competences. Through engagement in lectures, hands-on experience by working through the planned activities, designing new tasks well as peer critique, teachers will learn how to plan STEM lesson so that learners are engaged in critical thinking to understand the complex factors that define persistent real-world ill-defined problems and describe the limitations of current STEM solutions. Upon understanding and distilling a problem into its component parts, learners collaborate and engage in group problem solving. During group problem solving, learners generate plausible solutions, present their ideas, critique solutions, defend their solutions and collectively improve their ideas. This professional development programme will comprise face-to-face lectures, hands-on sessions and small group consultations in STEM lesson package design.

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## INS2211 From Physics to STEM Teaching: Emergent level

*Duration: 3 hours*

In this course, participants will learn to implement an integrated STEM activity based on a popular design-based activity in physics: “design a container to keep stuff hot/cold”.
Participants will gain familiarity with the S-T-E-M Quartet through using it to analyse the integrated STEM activity. Participants will also gain ideas on how to modify the STEM activity to make it a problem-centric, solution-centric, or user-centric activity.

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## INS2212 Ensuring Lab Safety and Risk Assessment in a Chemistry Lab for Beginning Teachers

*Duration: 8 hours*

This course covers different aspects of ensuring safe laboratory practices for the teaching and learning of chemistry in a secondary school science lab. We will look into how lab safety and risk assessment in a chemistry lab can be carried out.

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## INS2213 Ensuring Safety Laboratory for Teaching and Learning of Physics

*Duration: 7 hours*

In this course participants will learn to identify various hazards in a physics lab as well as how to assess the potential risks in activities carried out.

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## INS2214 Stimulating and Simulating Physics for JC Teachers

*Duration: 12 hours*
Pre-university students should learn more than the subject content. They need to cultivate attitudes, develop higher-order skills, and build competencies to continue to learn beyond school and for life (e.g. digital literacy, data competencies, 21CC).

As teachers, how can we nurture student agency so that they are increasingly self-directed, while still ensuring that the aims of the syllabus are achieved?

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## INS2215 Practices of Science: Designing for scientific argumentation in science classrooms

*Duration: 6 hours (including e-learning)*

Scientific argumentation, an essential practice of science, is integral to scientific inquiry.
By engaging students in scientific argumentation, students can learn how to argue scientifically and also learn science through argumentation. This course provides an introduction to scientific argument and scientific argumentation, as well as design principles for planning a scientific argumentation lesson.

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## INS2216 Digital Doodle and Sketch – Visuacy in Design Thinking

*Duration: 24 hours*

This course aims to expound on visual thinking protocol and designing through doodles, sketches and drawings for cognitive development in general education. Emphasis is placed on developing participants' digital sketching skills through practices and simple design activities.

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## INS2217 Microcontroller: Values & Fun Applications! (Sec Level)

*Duration: 24 hours*

The course will cover analysis of design problem, coding to program microcontroller for its intended solution, and testing and application in electronics board (with microcontroller) for the intended design outcome. Pedagogical stance in the teaching and learning of microcontroller will be demonstrated and emphasised with the aim to support teaching and learning in the classroom.

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## INS2218 Safe Laboratory Management for Biology Teaching and Learning

*Duration: 4 hours*

This workshop is designed for Biology teachers teaching at the secondary or JC levels. Participants will learn how to ensure laboratory safety when conducting the Biology practical work. There will be hands-on-activities for teachers to learn to handle common laboratory incidents during Biology practicals.

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## INS2219 Teaching Disciplinary Ideas in Chemistry at O-Level: Acid-Base Chemistry

*Duration: 3 hours*

This is one of three courses aimed at helping secondary chemistry teachers to teach Disciplinary Ideas in Chemistry. It focuses on the preparation of salts in the laboratory and how key concepts in the topics of Acids, Bases & Salts, Qualitative Analysis, Separation Techniques and Chemical Calculations come into play in the salt preparation. Participants will conduct experiments as well as develop instructional materials to teach Disciplinary Ideas involved in acid-base chemistry.

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## INS2220 Teaching Disciplinary Ideas in Chemistry at O-Level: Redox

*Duration: 3 hours*

This is one of three courses aimed at helping secondary chemistry teachers to teach Disciplinary Ideas in Chemistry. This hands-on course focuses on experiments in redox chemistry and how overarching ideas in the topics of redox and Chemical Calculations are conceptually linked across and within the different sub-disciplines of Science. Participants will conduct experiments as well as develop instructional materials to teach Disciplinary Ideas involved in redox chemistry.

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## INS2221 Teaching Disciplinary Ideas in Chemistry at O-Level: Organic Chemistry

*Duration: 3 hours*

This is one of three courses aimed at helping Secondary chemistry teachers to teach Disciplinary Ideas in Chemistry. This hands-on course focuses on the preparation of esters in the laboratory and how key concepts in the topics of Organic Chemistry, Rate of Reactions, Separation Techniques and Chemical Calculations come into play in the ester preparation. Participants will conduct experiments as well as develop instructional materials to teach Disciplinary Ideas related to organic chemistry.

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## INS2222 Secondary Science Teaching and Learning – Interdisciplinary Concepts (Part 1)

*Duration: 6 hours (including e-learning)*

This is a two-part course related to teaching lower secondary science using interdisciplinary concepts. Each part consists of two 3-hour sessions. In this first part, participants will learn the key ideas related to cross-cutting concepts and disciplinary core ideas and how these are related to the revised science curriculum in Singapore. Further, participants will also learn how to (1) use socio-scientific issues (SSI) as a means to bring ideas of Science, Technology, Society and Environment (STSE) to their students. And (2) participants will experience and design Integrative Activities (IA) to incorporate ideas from different topics within a theme and ways of thinking and doing science (WOTD) to allow learners to experience science learning in a more holistic way.

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## INS2223 Secondary Science Teaching and Learning – Interdisciplinary Concepts (Part 2)

*Duration: 6 hours (including e-learning)*

This is a two-part course related to teaching secondary science using interdisciplinary concepts. Each part consists of two 3-hour sessions. In this second part, participants will learn the key ideas related to the theme of Diversity and also using Models in science.

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## INS2224 Understanding scientific writing, reading and representations

*Duration: 3 hours*

Writing in science and deciphering scientific writing has traditionally been perceived as complex and difficult for learners of science. Scientific terms may sometimes have a different meaning when used in everyday context. The complexities of meanings packed in scientific terms need to be unpacked for learners before they can understand the concepts and ideas in science. Similarly, learners also need to know how to present their ideas in a “scientific” manner so as to be accepted by the scientific community.

In this session, participants would learn the textual, symbolic as well as graphical representations that are widely used to communicate scientific ideas. Participants will then work together to devise a plan to help students in their classes read and write science.

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## INS2225 Questions Cues and Prompts

*Duration: 3 hours*

Identifying and asking the right questions serves as important anchors for students' thinking and explanations. As such, appropriate question cues and prompts applied in the classroom would enable students to engage more productively and meaningfully in their learning.

In this course, participants will learn to apply different questions cues and prompt to enhance students' thinking.

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## INS2226 Integrating STEM into Professional Learning Teams

*Duration: 24 hours*

STEM learning builds students' ability to apply knowledge of science, mathematics, engineering and technology to solve real world problems. Through carefully planned lessons comprising thoughtful problem framing, scaffolds and availability of resources, teachers will be able to guide students in their learning. As such, understanding the pedagogical principles that can be applied to STEM professional learning teams would better enable teachers to study and apply their knowledge to plan better STEM learning experiences for students.

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## INS2227 Chemistry Laboratory Safety Course for Laboratory Technologists

*Duration: 8 hours*

This course covers different aspects of ensuring safe laboratory practices in a secondary school science lab. We will look into how lab safety in a chemistry lab can be carried out.

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## INS2228 Feedback to Feedforward

*Duration: 3 hours*

Giving appropriate feedback to students' assignments helps students to better understand gaps in their learning. This in terms facilitate more targeted intervention strategies to enable students and teachers

## IHS1042 Time, Change and Continuity

*Duration: 24 hours*

This course covers the histories of Singapore and early Asian civilizations.

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## IHS1043 Culture and Identity

*Duration: 24 hours*

This course aims to provide teachers with a deeper conceptual understanding of the different facets of Identity and Culture. There will be opportunities to explore the elements that make up one's identity and the meanings of culture beyond the 3Fs – Food, Fashion & Festival. The common misconceptions about culture and aspects of culture beyond race and ethnicity will also be examined. Participants will be encouraged to share about how culture is taught in their schools and to critically reflect on issues related to instruction on culture and identity in Social Studies. Pedagogical approaches such as inquiry, co-operative learning and discussion techniques will be modelled in the sessions so that participants will be made cognizant of some engaging instructional strategies that will enable their primary school pupils to develop meaningful connections and understandings about culture and identity.

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## IHS1044 People and Environment

*Duration: 3 hours*

This course aims to develop in teachers a geographical perspective towards citizenship education in the primary social studies curriculum. They will acquire conceptual knowledge of selected topics on the geography of Singapore and Southeast Asia in the curriculum. Appropriate pedagogical approaches for teaching primary social studies will be modelled. There is a mix of in class and out of class learning experiences.

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## IHS1046 Designing Virtual Fieldtrips for Primary Social Studies

*Duration: 14 hours (including e-learning)*

Participants who are Primary School teachers will be engaged in designing and conducting virtual fieldtrip packages.  They should be able to value-add their current school's Social Studies curriculum.

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## IHS2288 Social Studies Issue Based Seminar 1 - Citizenship and Governance

*Duration: 3 hours*

This seminar will examine recent issues pertaining to citizenship and governance in Singapore of relevance to upper secondary Social Studies syllabus. The seminar will clarify and unpack key concepts and theories that will allow participants to have better conceptual and theoretical understandings of the issues in question. Through seminar discussion, participants will also learn about different perspectives on the particular topic(s) pertaining to citizenship and governance. Finally, participants will also be guided to discuss and explore how the seminar learning points may be applied to their teaching of SS Issue 1.

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## IHS2289 Social Studies Issue Based Seminar 2 - Societal Diversity

*Duration: 3 hours*

This seminar will examine recent issues pertaining to societal diversity in Singapore of relevance to upper secondary Social Studies syllabus. The seminar will clarify and unpack key concepts and theories that will allow participants to have better conceptual and theoretical understandings of the issues in question. Through seminar discussion, participants will also learn about different perspectives on the particular topic(s) pertaining to societal diversity. Finally, participants will also be guided to discuss and explore how the seminar learning points may be applied to their teaching of SS Issue 2.

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## IHS2290 Social Studies Issue based seminar 3 - Globalisation

*Duration: 3 hours*

This seminar will examine recent issues pertaining to globalization that is of relevance to the upper Secondary Social Studies syllabus. The seminar will clarify and unpack key concepts and theories that will allow participants to have better conceptual and theoretical understandings of the issues in question. Through seminar discussion, participants will also learn about different perspectives on the particular topic(s) pertaining to globalization. Finally, participants will also be guided to discuss and explore how the seminar learning points may be applied to their teaching of SS Issue 3.

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***Disclaimer: Information is correct as at February 2023.***